the American Perfumer
and ESSENTIAL OIL REVIEW

COSMETICS · SOAPS · FLAVORS

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Editorial Comment

A Bright Future for the Toilet Goods Industry

S. L. Mayham, executive vice-president of the Toilet Goods Association, Inc., has provided us with this month's editorial through his excellent report to the members of the Association.

He advises that members investigate the possibility of dropping as many hand operations as possible, favoring mechanical ones. Strongly entrenched, highly mechanized industries are eyeing this lucrative field with the thought of post-war participation. If they do decide to enter the cosmetics business their manufacturing practices will be as economical as possible, which means a high degree of automatic production. Established firms would do well to examine their methods for efficiency.

The volume of business in the toilet goods field, although it has grown phenomenally during the war years, has not begun to reach the saturation point, according to Mr. Mayham. By way of emphasis he points out that even now total sales of packaged dentifrice amount to less than two packages per user annually. Total sales of lipsticks amount to about three per person annually, and two-thirds of these are the small 10c store variety.

One reason that sales have not been even higher than they now are is that certain essentials have been scarce. Perhaps this has been just as well, as an unrestricted production to meet total demand would have resulted in such rapid growth that it might not have been healthy. This would be especially true if living standards should fall, through a depression or otherwise, as most of the recent sales increase has been through new buyers.

He found it disturbing that some of the new development in the industry came from outsiders. For example, protective creams were introduced, and the resulting large monetary benefits reaped, by a large chemical company and a big electrical company. The industry should see to it that it is not caught napping in such matters.

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Try this for size

How Methocel Improves Printing Gloss

Printing buyers frequently desire an exceptionally high gloss finish in printing inks. To get this effect, it has been necessary to varnish the paper after printing—a rather costly, time-consuming procedure.

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CHEMICALS INDISPENSABLE TO INDUSTRY AND VICTORY

Desiderata

by MAISON G. DeNAVARRE

M. G. DeNavarre at work in his laboratory

It is surprising indeed how many times one encounters cosmetic products made with a mixture of castor oil and hydrocarbons. The two simply don't mix. So long as they don't mix, you have a problem to devise a procedure or formula that will not cause one or both ingredients to throw out. A coupling agent is needed —in substantial amounts. Lanolin is a good one. Beeswax is another. Spermaceti, the higher alcohols and synthetic esters are good, providing either is used in sufficient quantity. And don't believe in the malarkey that castor oil doesn't turn rancid. It does, *and how*. Get a reliable antioxidant into the oil phase, preferable in the presence of 0.01% citric acid which seems to activate most antioxidants. The gallates are coming up as darn good derivatives to prevent rancidity of fats.

IRISH MOSS VERSATILITY

A 1% mucilage of Irish Moss when mixed with a solution of wetting agent increases the viscosity to a thick syrupy consistency. Just what you want in a soapless foaming shampoo! It is one of a few things that seems to work without impairing foaming properties.

SUSPENSIONS

In a routine checking of two particular emulsions containing suspended pigments, we tried sodium alginate, Irish Moss, acacia, karaya, tragacanth, methyl cellulose, sodium methoxycellulose and colloidal silicate gels. The results are quite interesting in that the suspending agents all seem to possess a specificity for a particular formulation. Findings on simple suspensions of say calamine or kaolin were not duplicated on this formula. Nor was there any predictable effect. It seems like you still have to do it the hard way.

FACE POWDER STAIN

A recent article in one of the dermatological journals calls to mind the work done about 2 years ago in my laboratory on the degree of potential stain of over 100 different face powders. Virgin wool swatches were used in place of hair. Artificial perspiration was used along with the face power under test. The degree of stain produced varied from no stain at all, to deep-flaming orange-reds. This series of tests were made after having encountered the stain on white and light human hair. It was surprising to find that quite a few face powders were practically free of stain, but the number that stained badly was likewise surprising. Therefore, here is another test for face powder that has never been made heretofore, before releasing it for sale.

PERMANENT WAVE MILKIFIER

In recent times, this column has carried descriptions of at least a half dozen materials intended for use in making milky permanent wave solutions. Along comes another supposed to be stable in stronge electrolytes. It produces a thin, brilliant white emulsion, quite unlike the ordinary run of emulsifiers. It is a little more difficult to handle since it is not an oil, but this is not a real drawback so far as I can see. Price seems to be all right too.

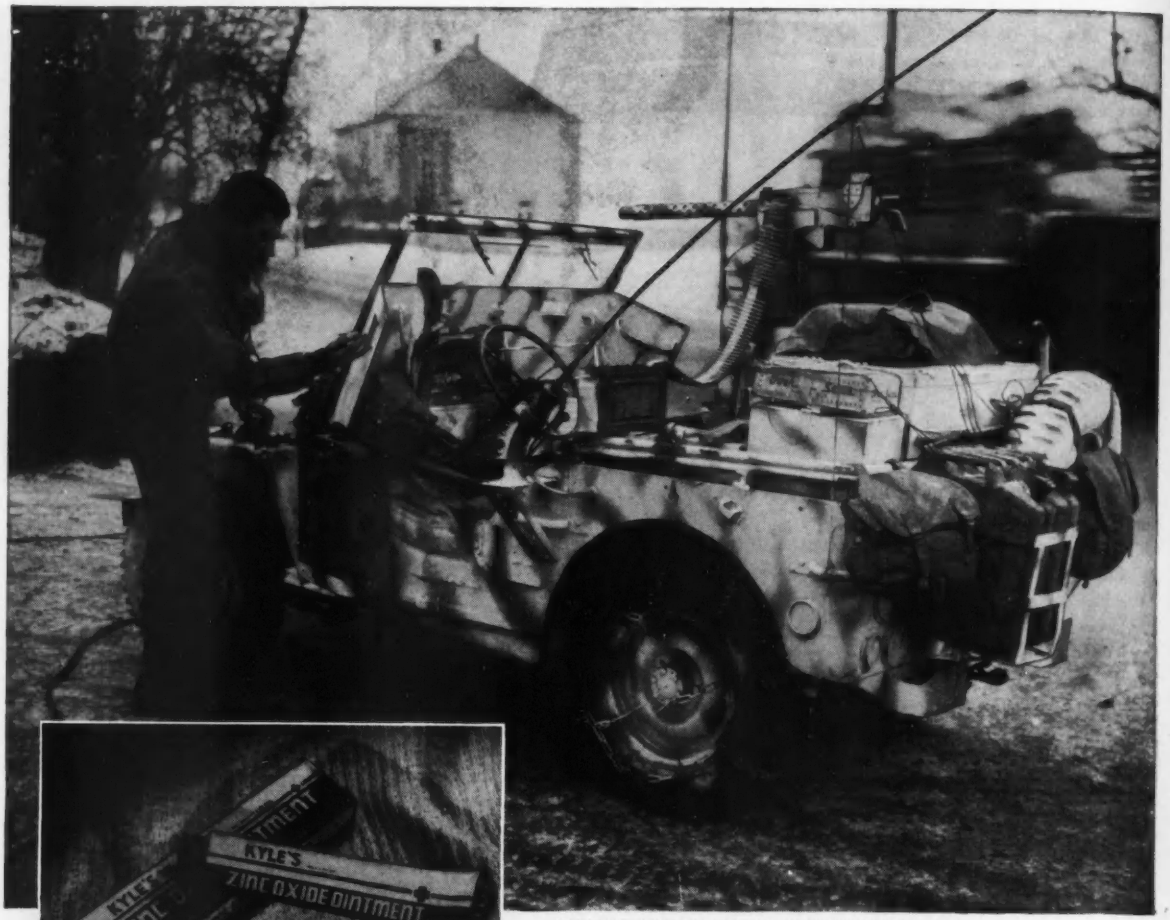
LOTION ANTI-FREEZE

A particular lotion formula was tested with different anti-freeze combinations. The lotion was brought to 10°F, kept that way for 24 hours, then placed in an oven at 100°F for 24 hours. The lotion was then observed for variation from the control sample not so treated.

One sample contained 5% alcohol. The second sample contained 5% glycerin. The third sample contained 2½% of each glyercin and alcohol. Both samples containing the glycerin had properties more like the control than the sample containing alcohol alone. It is essential that the series be continued with other anti-freeze ingredients including sorbitol syrup, diethylene glycol monomethylether, propylene glycol along with mixtures of these in the same formula. However, in the experiments made, the study at the time interested itself in only alcohol and glycerin. In another formulation, it is possible that opposite findings might prevail.

DESSERTS & PUDDINGS

Starch of one kind or other has been the time honored gelling ingredient of most puddings and desserts not made with gelatin. Now a new colloid has been developed that completely eliminates the starchy taste and mealy character of common puddings. It produces a custard for example, that has the starch containing product beat by many miles. It is a real treat and something every progressive and alert dessert manufacturer will have to investigate to be convinced. It IS something new in dessert bases.



PAINTING INSIGNIA ON NEWLY CAMOUFLAGED JEEP

BEST SELLERS

THIS year's best-selling car is the Jeep . . . and as usual, every year—in collapsible tubes—it's SHEFFALLOY, *Sheffield Process* Tubes. Wherever the indispensable jeep may be found in just about every battlefront of the world, there, too, you'll probably find these tougher SHEFFALLOY Tubes. They are serving dependably as containers for medicinal and pharmaceutical ointments, tooth paste, shaving cream, and other vital requirements of our fighting forces. Only the toughest, most dependable tube you can buy is good enough for your product. That means *Sheffield Process* Tubes and VINICOTE . . . a series of over 50 Inner Coatings. Now many products unfriendly to collapsible tube metal can safely be packed in these better liked containers. When you make plans for *your* future "best sellers" . . . remember *our* best sellers, *Sheffield Process* Tubes and VINICOTE.

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QUESTIONS AND ANSWERS

550 LEG MAKE-UP FORMULA

Q: *Will you be so kind as to send us the complete working formula for leg make-up mentioned in the April, 1944,* AMERICAN PERFUMER, *stating all the desired percentages to be added.* H. K. C.—MAINE.

A: The article mentioned gives the range of ingredients found most useful but we append the following more specific formula.

Zinc Stearate	2%
Titanium Dioxide	3.5%
Colloidal Aluminum Magnesium Silicate Gel	20%
Isopropyl Alcohol	6%
Umber	½%
Yellow Oxide	2½%
Red Oxide	2½%
Propylene Glycol	1%
Methyl Cellulose 1500 Viscosity	½%
Water, Perfume & Preservative to make	100%

Procedure: Mix the isopropyl alcohol, equal parts of water, and the propylene glycol with the perfume. Blend in zinc stearate and the other pigments, mix until a smooth, even dispersion is obtained. Make a mucilage of the methyl cellulose with the balance of the water. When prepared, mix in the colloidal silicate gel. Add this mixture to the pigments and then pass through colloid mill. Take care not to occlude air into the formulation.

551 PERFUME SOLUBILITY

Q: *Will you be kind enough to advise us if there is something that can be added to perfume oils which are to be used in a lotion with a low percentage of alcohol—say 50 per cent or less—that would tend to increase the solubility of the perfume compound—such as perhaps a sulfonated oil or triethanolamine oleate.*

M. M.—TEXAS

A: There are several specialty solubilizers made to do exactly the thing you want. The names of the companies and the materials are sent to you under separate cover. Ordinarily, it takes from 3 to 5 times as much solubilizer as of perfume compound. The two are mixed at the lowest possible temperature and when uniform, the mixture is added to distilled water or water containing some alcohol. Ordinarily, the alcohol is added after the product is allowed to stand for a while. The entire combination is then allowed to stand for final precipitation of any colloidal particles and is filtered.

552 SOAP SUBSTITUTES

Q: *In the January, 1936, issue of* THE AMERICAN PERFUMER, *page 77, deNavarre mentions triethanolamine myristyl and lauryl sulfonates as soap substitutes for soapless shampoo. Is myristyl or myristate a synthetic detergent? Who makes it? What proportion is recommended?*

G. J.—MARYLAND

A: The compounds mentioned are derived by sulfonating myristyl or lauryl alcohols. The sulfonated product is neutralized with triethanolamine. The resulting compound has a high water solubility and is related to a long line of wetting agents sold by the company whose name is given to you under separate cover. To our knowledge, these compounds are not available in this country as such, but have been readily available up until the time of the war, in England. Ordinarily, you would use from 5 to 20 per cent of either triethanolamine myristyl sulfonate or of triethanolamine lauryl sulfonate with sufficient propylene glycol or glycerine to maintain solution and to prevent precipitation at low temperatures, in making a soapless shampoo.

553 MACHINELESS OIL SACHETS

Q: *Would it be possible for you to supply us with a formula for cream shampoo, and a formula for machineless oil sachets, along the line of Bonats "Padol"?*

M. L.—WISCONSIN

A: Cream shampoo is nothing more than a paste made from either soap or wetting agent. Essentially, a good shaving cream formula will make a satisfactory cream shampoo, and we suggest that you try some of the formulas on pages 429 and 430 of deNavarre's Chemistry and Manufacture of Cosmetics as a type that are known to work satisfactorily. You may also wish to experiment with a wetting agent by adding a dry wetting agent to the colloidal gel of magnesium and aluminum silicate, sold under a trade name, the supplier of which is given to you under separate cover. Ordinarily, at least 20 per cent of wetting agent is required in such a paste for satisfactory performance. Your product will need from 10 to 15 per cent of glycerine or propylene glycol to keep it from drying out. Keep the liquid additions at the lowest point to retain consistency. Some wetting agents are sold as pastes and have been simply perfumed and tinted and repackaged. We are not acquainted with the machineless oil sachets mentioned, but if you care to send a sample, we will be glad to give you further advice.

554 VARIATION IN EMULSION FORMULAS

Q.: *We have been informed to write to you in regard to formulas for emulsions of lemon, lime and cherry. Please give us information on these three items at your earliest convenience.* R. A. G.—OHIO.

A: In a series of articles appearing during 1944 considerable information on the formulation of flavor emulsions has been published. In general, 5 per cent of the oil is mixed with a certain amount of gum, depending on the gum used and the whole is emulsified with water, subsequently passed through a colloid mill or homogenizer. As an example, a mixture of 8 ounces of citrous oil with approximately 7 ounces of brominated vegetable oil are mixed with 5-6 ounces of powdered gum arabic and stirred until no lumps remain. Eight ounces of sugar syrup or glycerin are then added, thoroughly mixed in and then sufficient water is added to make one gallon. This mixture is passed through a homogenizer and it may be colored with FD&C yellow No. 6. This type of emulsion is especially suitable for use in making carbonated beverages because the presence of brominated oil has adjusted the specific gravity of the citrous oil so that it tends to separate much less than it might otherwise. Many other variations in formula are possible.

Fresh and exhilarating as the flower itself—WARDIA—an entirely synthetic Rose character, is meeting the most exacting demands of discriminating perfumers. Used by itself or as a replacement for the natural Rose oil it is invaluable. A Chuit, Naef product, ample stocks are available in this country—$58.00 per pound—a trial ounce $3.75.

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Natural Perfume Discoveries Await Chemists

Although the chemistry of synthetic perfumes expanded considerably there are countless and absorbing discoveries for chemists interested in research and who have specialized in the field of natural perfume

by PAUL LANGLAIS, D.Sc.

ALTHOUGH the chemistry of synthetic perfumes expanded considerably a few years ago to become one of the most important branches of organic chemistry we must, unfortunately, realize that the branch of chemistry involving the extraction and refinement of natural perfumes has remained almost static for several decades.

In the course of twenty-five years spent in the research laboratories of two important factories at Grasse, we could not help but notice the scarcity of scientific papers and the dearth of experiments on this subject which we know to have been conducted in plants processing natural products.

FIELD IS STILL UNEXPLORED

The work of Passy[1], Hesse[2], Charabot[3], etc., had, however, paved the way for research workers. Perhaps it was the seeming barrenness, or the delay in obtaining fruitful results, which dampened the enthusiasm of research workers in natural perfumes, and caused them to transfer their attention to synthetic products. Yet countless magnificent and absorbing discoveries await those chemists who are passionately interested in research, and who have specialized in the field of natural perfumes.

We shall illustrate but one example of such discoveries in detail; it concerns the improvements which are capable of being produced in the manufacture of certain floral oils through the application of special methods.

There is reason to turn to good account the work of the above-cited scientists who were the first to bring to light the biological properties of certain flowers which continue to emit essential oils after they have been picked, and to underscore the benefits which might be derived from the hydrolysis of certain odorless glucosides in the liberation of perfume.

PRODUCTION COSTS A FACTOR

The motivating interest in continuing this research work is the very important one of lowering the cost of production—a very serious consideration under present conditions. The originality of the floral products have no connection with the mixtures of synthetic and natural products. The latter obviously reduce the standard price, but are not likely to gain the favor of competent perfumers.

To make this point clear various pertinent works which have been published will be briefly reviewed. In a memorandum relative to operation under Patent No. 717,445, Charabot turned his work on the formation of odorous substances to good account, and became the first person to bring a new method of extracting floral essence to the perfume industry. He maintained that floral perfumes, and more generally still, natural perfumes, are most frequently highly complex mixtures, in which unidentifiable constituents play roles of major importance alongside of the most abundant constituents. Moreover, certain substances whose aromatic properties might seem to be of secondary importance are of great consequence from the point of view of harmony in the natural composition. In some way they infuse life into the perfume, whereas the artificial concoction generally retains a certain harshness and artificiality which attenuates the full charm which the aroma of flowers exerts over our sense of smell.

It is this type of imponderable substance (today referred to as "paragénoses," to use our friend Sabetay's term) which lends it the perfume released by the flower its fascination.

RESEARCH BY CHARABOT

Charabot believed that by bringing odorous substances in contact with the flower in such manner as not to interfere with the functioning of the cells, but so as to modify the biochemical balance, the flower would be capable of producing certain substances in addition to the ordinary odorous substances. These would lend the whole a distinctive charac-

ter, provided that they differ qualitatively from the substances which normally go into the composition of an essential oil. They would bring about a notable improvement in the flower and in its constituents, provided that they belong to the category of substances which are normally contained in the flower in small amounts.

Such was Charabot's theory. In order to define the nature of the substances thus produced he designated them under the name of "genessences." But it must be admitted that if his ideas were felicitous from a theoretical point of view, the industrial application did not meet all the logical expectations, and the "genessences" did not enjoy as great a success at the time as one had reason to expect.

TWO CATEGORIES OF FLOWERS

If the enrichment of the compounds, effected by the flower through the application of the elementary substances in the course of cellular activity seems fascinating, there is still another point which should prove to be interesting. In the highly interesting book written by Charabot and Gatin, and entitled "Le Parfum Chez la Plante" (perfume in plants) from which certain information has been borrowed, the following paragraph is quoted verbatim: "As believed by J. Passy and proven by A. Hesse, there are two categories of flowers; those belonging to the first group keep right on supplying odorous substances when placed under conditions which permit the continuation of their vital functions; the others hold all their odorous elements in an uncombined state and are thus incapable of producing any more, even if their life is not cut short. From a practical point of view one can well conclude that inflorescence is the most logical process of extraction for the first group and that, on the other hand, it would be the least practical for the second group. A. Hesse advances the thoroughly plausible hypothesis that in the first instance, the odorous substances are formed by the decomposition of certain compounds, possibly of glucosides." Such were the views expressed by Charabot and Gatin.

Personally, we believe that as regards the second group, that is the flowers which contain all their odorous elements in a free state, are not incapable of producing additional odorous elements, the above theory to the contrary. In our opinion they need only to be provided with the means for hydrolysis which they lack. If the flowers of the first category, such as jasmine and tuberose, which probably contain in their tissues the enzymes which favor the decomposition of the glucosides, continue to release perfume; is it not possible by hydrolysis to provoke such decomposition in flowers of the second class, roses for example, which seem to be deprived of these soluble hydrolytic ferments?

These are the basic substances extracted from plants which decompose under the action of special agents, known as soluble ferments, either diastases or enzymes, thus forming glucose, or a wide variety of compounds such as alcohols, phenols, aldehydes, etc. The decomposition may also be effected by means of dilute acids or alkalis.

This designation of glucosides has been extended to basic substances whose decomposition yields other sugars than glucose. Decomposition through the action of enzymes does not always produce the same substances as those resulting from decomposition through the action of acids. The glucoside diastases are generally confined within special cells which separate them from the substances on which they can react.

Among the identified odoriferous chemical compounds liberated by such decomposition can be cited an ether, methyl salicylate (from essence of Bouleau); a phenol, eugenol (from essence of Benoite); such aldehydes as benzoic aldehyde (from bitter almonds); salicylic aldehyde (from the salicin in the willow and the poplar, and from another glucoside found in meadow-sweet); and vanillin, which is a phenol aldehyde. Also among the liberated substances can be cited a lactone, coumarin, nitriles, such as cyanhydric acid (bitter almond), phenylacetic nitrile (watercress), isosulfocyanates such as allyl oil (black mustard), and by decomposing sinigrin with a diastase known as myrosin, benzyl isosulfocyanate (nasturtium), and phenyl ethyl isosulfocyanate (mignonette). The sinalbin from the seeds of the white mustard plant are believed to decompose into oxybenzyl isosulfocyanate. Lastly, we find a terpene in $C_{10}H_{16}$, which is supposed to result from the decomposition of the bitter substance in the crocus plant, which is known as picrocrocin.

For example, Robiquet and Boutron Charland[5] established the fact that the essential oil did not exist in bitter essential oil of almonds, that the presence of water was indispensable, and that amygdalin, the glucoside it contained, only decomposed in the presence of the diastase known as "emulsin" according to the following equation:

$$C_{20}H_{27}NO_{11} + 2\ H_2O = 2C_6H_{12}O_6 + HCA_z + C_6H_5 - CHO$$

Glucose — Cyanhydric acid — Benzoic Aldehyde

When in the plant the amygdalin is not often decomposed; the reason being that it is separated from the emulsin.

Such is also the case with the leaves of cherry-laurel, which must be ground in a mill before the emulsin can decompose the glucosides. The reaction, as indicated by Charabot is as follows:

Glucoside + Water = Glucoside + Essential Oil

And, according to him, it is restricted by the inverse reaction. A state of equilibrium is established when the glucoside and the essential oil shall have attained a certain proportion.

VARIOUS EXPERIMENTS DISCUSSED

Now that the above points have been explained, the experiments conducted will be discussed. Place in each of two receptacles of equal capacity an equal amount, by weight, of Mavroses, and cover with equal quantities of liquids. The first of these liquids consists of water, the second, of water with 2 grams of sulfuric acid, 66 degrees Baumé, per liter. Let these stand for approximately an hour and then remove equal quantities of liquid from each of the receptacles.

The color in both cases is not identical. Whereas the unadulterated water has remained almost colorless, the water containing the acid has turned a very vivid pink. The pink colored water, resulting from the in-

fusion of the aqueous acid, has a much stronger fragrance than the plain water. This difference in aromatic strength of the two liquids is of supreme importance. This pink coloring may be attributed to the well known phenomenon of the colored indicators used in acidimetry, such as litmus paper, violet dyes, etc. If a few drops of caustic soda are added the color of the acidified water turns green, whereas the neutral solution shows no color change. Therefore, there is every reason to believe that the glucoside in the roses has been decomposed. As another means of demonstrating the presence of glucosides in acidulated water an equal quantity of the two liquids was placed in two test tubes. Equal quantities of Fehling's solution were added and the contents were brought to a boiling point. Soon the tube containing the acidulous water started forming an abundant quantity of red copper oxide precipitate, whereas the tube containing the plain water showed no reduction of its contents during the same period of time.

This experiment tends to prove that whereas the glucosides in the rose did not decompose, and therefore remained odorless in the case of the solution of plain water, the same glucosides were readily hydrolyzed by the acidulated water.

In the course of the research which Charabot[4] conducted, it had been considered that the formation of odorous compounds (when one leaves the plants means for prolonging its life intact, or at least its cellular functions) may be modified by diverse conditions of environment and of biochemical equilibrium.

Charabot offered the following example to illustrate his ideas on the subject: In the course of a reversible, and therefore limited, biochemical reaction, such as a diastatic reaction,[4] two bodies, for example, are being formed. One of them, let us say, happens to be systematically placed in what constitutes the center of the reaction. This reaction slows down and the diastatic action is modified. Other substances are formed with greater activity. On the other hand, if this body is removed as it is being formed the generating division continues, since one is thus constantly removing the stabilizing conditions which put an end to the reaction. We know that during the process of inflorescence in jasmine, an exchange is effected between the element in which the exhaustion takes place (the oil) and the fragrant constituent of the cells.

These exchanges afford an explanation of the extremely interesting differences in composition between the odorous substance extracted by a lengthy inflorescence and the fragrant product extracted immediately from the flower by means of a volatile solvent.

WHAT HESSE PROVED

Hesse's experiments proved that methyl anthranylate and indole are found in a free state in jasmine flowers. They are found in intricate compounds which easily disintegrate during inflorescence. His experiments further show that the jasmine flower liberates approximately five times as much essential oils during inflorescence as it originally contained; the tuberose liberates about twelve times as much. But these observations have rarely been put to good use in having the flower form an odorous substance during the extraction of the natural perfume, and a certain amount of perfume was liberated which would not have been released if the roses had been treated directly without preliminary treatment with solvents or distilling agents.

It is, therefore, obvious that flowers which hold all of their odoriferous substances in an uncombined state are not incapable of producing such substances, anew, even if their life is interrupted; for water, even when it has a low acid content, does not kill the flower as would volatile solvents or steam distillation. In fact, several extractions may be made from the acidulated water to remove from it the essential oils which have been dissolved. Those roses which have been exhausted by the solvents can be treated, and the two essential oils combined. When jasmine is substituted for roses no extraction takes place. Even after a long period of infusion there is a complete lack of glucose in the solution, and reaction of the Fehling solution is absolutely negative.

We believe that by combining the two basic substances we have referred to, and in view of the interchanging we have spoken of, by using only natural products, for the creation of additional constituents, we make it possible for nature to correct these constituents.

These products, we believe, will not compete with the natural absolute oils which, when really artistically combined, shall maintain the lofty place of honor which they have achieved.

PROGRESS TO BE REALIZED

There would still be a great deal to say regarding the progress still to be realized in the field of natural perfumes, particularly in regard to the absolute suppression of fatty or rancid odors in products made from pomades and in "chassis" oils.

Of course, in the declining years of a life spent entirely in doing research, we admit that the failures have far outnumbered the successful ventures. These very numerous failures, however, must not discourage us; on the contrary, they must provide us with valuable information.

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Short Adages

by R. O'MATTICK

POSTUM'S sponsored Henry Aldrich Radio Program gave such a good boost to the Perfume Industry two days before Mother's Day that Dr. Rowmaterial is tempted to abandon coffee forever, and drink nothing but Postum, unless the programs sponsored by the various coffeemakers do something about it.

* * *

A recent science news release mentions a new chemical treatment which makes it possible to produce stockings that won't run, pants that won't shine, suits that won't wrinkle, and woolens that won't shrink. Now all we need is a new chemical treatment to produce perfumes that won't fade out. And then what? There will still be consumers to complain that the scents don't last.

* * *

Says Pat Chouli, that incurable cynic and man of worldly wisdom:

"I suggested the name 'Fountain of Youth' for our new talc—the boss liked it so much he's going to move the whole outfit to Florida!"

If every process that every chemist claims is workable and profit-making, really worked and *was* profit-making, there would be no dealers of second-hand chemical equipment.

* * *

The other month we had written a note about hobbies and asked our readers to tell us about their various hobbies (other than looking for sources for alcohol, or trying to get a few pounds of musk here and there).

One of the responses we received came from a perfumer in California (everything seems to come from California—Los Angeles papers please copy). He wrote that while he has no hobby such as stamp collecting, he owns a valuable collection of stamps which he would like to sell. We regret that we cannot help him. The only things that we can help anyone sell are items such as patchouli oil, vanillin, coumarin, etc., which no one as yet has helped anyone sell as no help is needed.

Those who can remember that far back, recall that this column was inaugurated during the early part of the war in order to lighten the burdens of those who were trying to buy this or that and found nothing but shortages. Now, we could not help them to locate the various commodities, but we feel that we have been of service with a quip here and there so that our readers would not forget how to smile. Hence we gave this column the name Short Adages, and from then on the rest is history.

Many of our fans (the number is really amazing, but our modesty prevents publication of the actual figure compiled by our Statistical Department) have been concerned with the name of our column. They thought that the war would end soon (that was in the days when the Germans were drinking beer on one side of the Maginot Line while the French were drinking wine on the other side of the Maginot Line), and that there would be no more shortages, and therefore no point in this column. Unfortunately, the war is still on! We look forward to the day when there will be no more shortages, and then we shall be content to have this column go into the scrap heap along with the forms which advise with deep regret your order cannot be accepted.

* * *

Suppressed Desires in Interoffice Communications.

Dear Wilbert:

I met Mr. Nurve through Mr. Grate and he is a very good prospect. He says he will be glad to give us an opportunity to supply him with benzyl benzoate provided our quality and price are right, and if we have any vanillin he will give us the business.

Sincerely,
Sand L. Wood

Dear Sand:

I am glad that you met Mr. Nurve. If I am driving a car and I see him on the road I will give him the business.

Wilbert.

* * *

A kind friend has just presented us with a bound volume of the Proceedings of the Twenty-Sixth Annual Meeting of the Manufacturing Perfumers Association, held at the Biltmore Hotel, just twenty-five years ago. The book, which we have only had a chance to look over, will undoubtedly furnish much interesting material for use in this column.

COLOSSAL is the word for the Pacific War. It will call for huge amounts of supplies, most of which will require double and triple waterproof packaging to prevent ravages of mildew and dry rot. Every man out there needs *96 tons* of supplies per year . . . which helps to explain why paper to pack and protect those supplies is a No. 1 war material shortage. That war paper doesn't come back . . . all the *more* reason why we at home should turn back for re-use every pound of paper we get.

"The First 40 Years Are the Hardest" Says Richard M. Krause

A Pioneer Chats Informally about the Early History and Development of Fine Packaging for the Perfume Industry

In 1906 when the concern was one year old this photograph of the entire organization was taken. It shows the equipment about which it proudly boasted: a printing press, a routing machine, two hot stamping presses.

Lower right: Richard M. Krause who celebrates 40 colorful, creative years in business in New York, July 3.

BACK over a half century ago in the Summer of 1890 when working papers for juveniles were unheard of, a twelve-year-old lad eager to earn extra spending money, got a job as a telephone operator with a chemical concern in the Williamsburg section of Brooklyn, N. Y. In those days the telephone was anchored to the side wall of the main office so that there would be ample room around it to lessen the risk of being electrocuted; but despite this he was intrigued by the fascination of using a telephone; for it bordered on the mystic to be able to converse with unseen persons.

One of his duties was to write down orders which came over the telephone from the company's office in downtown Manhattan. Not being too busy and with a pad handy it was the most natural thing for a boy of his energy to sketch, or doodle as it is now called, the various people who entered the office. His caricatures attracted the favorable attention of his associates on account of their likenesses and artistic approach. The ambitious young artist was Richard M. Krause, now head of the company bearing his name, which, after 40 years of progressive work, does business throughout the United States and in many foreign countries.

One of the older employees had a son in art school, to whom some of the caricatures were shown. The latter advised his father that the youthful Krause had undoubted talent, which, if directed, could be developed. This advice was relayed to Krause who promptly acted on the advice, attending art school for the next two years. Meanwhile he kept watching advertisements of concerns seeking a young man with a knowledge of drawing. In June, 1892, he found such an advertisement. At 7 a.m. next morning, young Mr. Krause, armed with samples of his art work, found himself first in line for the job. By 8 o'clock the line had swelled to 20 applicants of all ages but the man who conducted the interviews informed the group that

By 1918 the concern had grown so much that it was even cramped in quarters three times the size of the original plant. Above are shown die stamping presses and part of the staff.

since the firm was one of the best of its kind with a reputation for high standards, the one selected for the job would be required to remain with the firm for five years as an apprentice and would receive no salary for the first year. Undaunted, Krause accepted these conditions and began his apprenticeship with the Artistic Engraving Co. then located at 144 Wooster St., New York City. The firm incidentally is still in business at another location.

After serving several years with this concern Mr. Krause joined C. F. Beatty where he learned the intricacies of color printing and gold leaf stamping. At that time Mr. Beatty was a thirty-third degree Mason and did all of the elaborate color printing and gold stamping demanded by the lodges. Mr. Krause's success in handling this difficult work was so marked that an offer to join the firm of Henry & Sutherland came to him unsolicited. It was accepted and after seven years with this concern, his knowledge of the business, his enterprise and his indefatigable industry made him so valuable that he was offered an interest in the business. However, he had some other plans. Looking ahead he realized that there was a growing need to develop business along more original lines.

EARLY PERFUME LABELS

The American perfumery industry was then in its infancy. Labels for American perfumes and toiletries were mostly lithographed and in appearance similar to cigar bands and of about the same quality. Mr. Krause realized that if the American perfumery and its allied industries were to meet the overwhelming competition from France, neater and better packaging was necessary. To carry out his ideas he decided to go into business for himself. After reaching this momentous conclusion he resigned, blandly ignoring the fact that his funds were limited. He remained with the old firm one year longer to train a successor and then on July 3, 1905, with borrowed capital he launched his own business at 33 West Eighth St., New York, later moving to larger quarters at 25-27 West Third St. His equipment consisted of two hot stamping presses, a job press, several fonts of type, engraving machinery, a router and an inflexible determination to make the business succeed along the lines about which he had dreamed.

Evolution of a Label or Box Wrap: 1. First the proposed wrap or label is discussed from all angles: artistic, mechanical and practical. 2. The process most suitable for any particular job is determined at a conference of executives. Each job presents a special problem.

STAMPING PROCESS DEVELOPED

His first order was for box wraps stamped in metal leaf from the Pirika Chocolate Co. of Brooklyn. Fortunately his research had led him to develop a process for stamping in leaf and embossing by making brass dies suitable for that purpose. The new process aroused the interest of America's oldest perfume concern, the Theodore Ricksecker Co.; and a partner in the firm journeyed to the little print shop to get it to improve its packages.

Prior to 1914 all the high class French perfume labels were highly embossed steel die stamped with multi color printed effects which had to be handled by skilled artisans. The labels were hand made and required painstaking accuracy and attention to detail. The American ideal on the other hand then was mass production with quantity rather than quality the objective.

FRENCH COMPETITION WAS MET

To add to the difficulty of duplicating the fine French craftsmanship, pure gold leaf paper employed by them was not available in the United States. Consequently it had to be made here but as the French were inclined to keep their methods a closely guarded secret and as there were no trained men in the line in America the problem of making suitable gold leaf paper assumed major importance. This became especially acute when an order for 150,000 pure gold seals for the Mary Garden line came to him from Parfumerie Rigaud.

With this order it became absolutely necessary to find a way to rival the French method. There was

no pure gold paper to be had, especially the yellow gold shade called "Jaune" which was required to match the labels which hitherto had been manufactured for the company in France. Through persistent research, day after day and often far into the night, Mr. Krause perfected a size and method of coating gold paper. It was so successful that when his overalls were returned from the laundry he discovered that the pocket contained some of his gold paper which was none the worse for the ordeal.

Parfumerie Rigaud was so impressed with the high character of Mr. Krause's work that a $50,000 order was placed for the large size Mary Garden head seals. Success along the lines Mr. Krause had dreamed about, planned for and worked for, had come. More and more orders from other perfumers began to come to him. But things were running too smoothly; for it was soon revealed that the lacquer used to create the gold and silver labels and seals was highly inflammatory. This was a fire hazard that could not be tolerated in the heart of a great city; so the plant was moved from New York to 8440 129th St., Richmond Hill.

3. Production must be checked to see that the run conforms with the specifications set for the particular job as required in each detail.

4. Examining labels as they come from the presses is a necessary step involving faculties of keen perception to detect minute defects.

WHY CHICAGO PLANT WAS OPENED

By this time World War I had largely run its course. Supplies from abroad were restricted and at this juncture the late Francis Jones, head of Parfumerie Melba invited Mr. Krause to open a plant in Chicago to supply the needs of the Melba organization exclusively. Mr. Jones in fact offered Mr. Krause a large amount for a half interest in such a plant; but Mr. Krause declined the offer. However, he did establish a branch plant in 1918 at 323 West Washington St., Chicago, to take care of his mid-western accounts which was put in charge of Albert J. Anderson.

FAITHFUL EMPLOYEE REWARDED

Mr. Anderson had joined the organization in the Winter of 1918 when downtown Chicago had about eight feet of snow in drifts. It was impossible at the time to venture out so Mr. Krause was able to tutor his new employee. Anderson made good. The plant thrived and in 1942 Mr. Krause sold the plant to him.

When Canada put a 42½ per cent duty on American-made goods, Parfumerie Rigaud, United Drug Co. and other American concerns in the perfumery field established branch plants in Canada to take care of their business there. Mr. Krause also established a branch plant in Toronto in 1922 under Mr. Anderson's direction.

CANADIAN PLANT OPENED IN 1922

Unknown to many in the industry, Mr. Krause also had experience in the paper box industry back in 1907. Joseph Franks, now of the Du-Frank Corp. and J. E. Lansdowne, now operating a company under his own name, worked for him making paper boxes chiefly for cigarettes. Among the popular brands which were sold in Krause boxes were Pall Mall, Savory and Melachrino. The box situation was very tight at the time and it was then that the multi-millionaire Shinasi of Shinasi Brothers, Inc., offered Mr. Krause an Arabian horse if he would get boxes out for him by a certain time. Mr. Krause fulfilled his promise but declined the gift. Perhaps today he should offer Mr. Shinasi a horse for a pack of cigarettes. The Krause box interests were later sold to Hefter & Co.

During the past few strenuous years, due to the depletion of its staff of trained young men, the work of the organization has been carried on by its older employees—men who have grown up with the organization, men who have been especially trained for the work. The matching of colors, close tolerances in embossing and cutting and the ever-present necessity of following specifications minutely are things learned only in shops which universally maintain high standards.

RESEARCH TO MEET TRENDS

Much of the experience gained by Mr. Krause in his many years in business has been passed on to his son, Richard M. Krause, Jr., who has been associated with the company for 18 years. At the time of his enlistment in the armed services he had assumed the active management of the business.

With the elimination of the responsibilities of production Mr. Krause has been able to devote more time to research, merchandising comparisons and the proper approach to current trends in design so that packages may not only be designed in the most modern styles but may also be manufactured to meet the needs of customers whether the item be one selling at ten cents or ten dollars.

IMPORTANCE OF ART IN COMMERCE

The influence of art in fine packaging which Mr. Krause as the pioneer 40 years ago gave to the commercial world has undoubtedly been a factor in the development of the American perfumery industry to its present status of world leadership; and it has also been a factor in the commercial success of products made by numerous other industries.

Technical Abstracts from Scientific Literature

These brief abstracts listed provide a convenient key to current scientific literature of the world on perfumes, cosmetics, soaps, dentifrices and other preparations

The Determination of Iodine in Organic Compounds by Paul Block, Jr., and Kenneth L. Waters. The method of Johnson and Frederick for the determination of iodine in livestock mineral mixtures (1) has been extended to the analysis of organic compounds. This method utilizes an ignition at 700°C. with a mixture of sodium and potassium carbonates in the presence of manganese dioxide. The latter has again been shown to be essential for the prevention of loss of significant amounts of iodine at a temperature at which combustion is essentially complete. The advantages of this method over those in common use are the following: 1—faster than other combustion methods; 2—no special equipment is required other than a muffle furnace the temperature of which can be controlled; 3—the method lends itself readily to the subsequent volumetric determination of iodine through oxidation to iodate and reaction with excess iodine; 4—the method is general for all solid organic iodine compounds irrespective of molecular structure. The procedure has been applied successfully to the U. S. P. iodine compounds. (From the *American Pharmaceutical Association Convention Scientific Paper No. 1.*)

Paraffinoma. Dr. M. H. Ebert and (by invitation) Dr. M. Otsuka. *Arch. Derm. and Syphilology* **49**, 216, 1944. C. H., a white woman aged 72, presents firm masses in the cheeks. She states that forty years ago, she worked as a model. After an illness she looked emaciated, and to insure her position she had paraffin injected into her cheeks. The masses so deposited caused no discomfort and enlarged slowly until the last few years, when the areas became reddened and the enlargement noticeable. She came to Cook County Hospital because of bronchopneumonia and arteriosclerosis.

There is an irregularly oval mass in each cheek measuring about 1 by 2 inches (2.5 by 5 cm.). The one on the left has smaller satellite nodules extending toward the ramus of the mandible. These masses are firm and are movable on the deep tissues but attached to the dermis. The skin over them is reddened.

Histologic examination of a section removed showed the epidermis flattened and atrophic. The changes in the corium were in three zones. The upper zone was characterized by a perivascular round cell infiltrate. The second zone, which occupied the mid-corium and the level of the sweat glands, was beset with numerous empty spaces of varying size separated by a cellular connective tissue and histiocytes. The lower zone of the corium was greatly hypertrophied and made up of many strands of connective tissue with few empty spaces.

A specimen stained with Weigert stain showed senile elastosis of the upper part of the corium and complete absence of elastic tissue throughout the rest of the corium.

Observations on Bentonite U. S. P. and Magma Bentonite N. F. by Clare Olin Ewing and Frank W. Politi. Bentonite is a natural product that differs greatly in water absorption. Properties of the official product should be closely defined, otherwise wide variations will result in the appearance and viscosity of the official magma. An empirical method of standardizing the latter that has proved useful over twenty years of commercial practice is described. (Two figures.) (From *the American Pharmaceutical Association Convention Scientific Paper No. 19.*)

Use of Chlorophyll in Conditioning Air. *U. S. 2,326,672.* A solution of chlorophyll (in a solvent, such as water and ethyl alcohol, and which may be used conjointly with formaldehyde is sprayed into the air in a confined space such as a room to effect a freshening action on the air. (Through *C. A.*, **38**, *604, 1944.*)

Thiuram Sulfides. *U. S. 2,326,984.* Thiuram sulfides in a form resistant to dusting or flying are prepared by coating the finely divided material, in aqueous suspension, with a hydrophobic emulsifiable oil of the long-chain aliphatic type or wax, such as paraffin, separating the solids from the suspension, and drying them. (Through *C. A.*, **38**, *554, 1944.*)

Achromotrichia Through Pantothenic Acid of Deficiency. The Diversity of the Problem of the Functions of Pantothenic Acid. Klaus Schwarz. *Z. physiol. Chem.*, **275**, *245-57 (1942.)* Pantothenic acid (I) is a necessary vitamin for the formation of normal hair pigment. A diet for rats free from I produces achromotrichia, which is curable by synthetic I. Similarly, its onset is hindered by prophylactic administration of I. In the course of the development of this avitaminosis in young animals, a struggle for I develops between growth metabolism and melanin formation. Pigment formation and wt. increase do not run parallel; the needs of growth are first satisfied in most cases, particularly in temporary deficiency and in the prophylactic use of small doses. In all these cases, gray hair appears sooner than disturbances of growth. These differences arise from there being 2 different, unrelated functions of I diet and melanin formation. (Through *C. A.*, **38**, *2363-4, 1944.*)

Cosmetic Trends in the Middle West

Blue-purple lipsticks will be discarded this summer in favor of pure red . . . Deodorant sales said to be outstanding at men's cosmetic counters . . . Bad weather harms the leg make-up season in most cities

by JEAN MOWAT

THE first post-war indication of a change in the presentation of cosmetics is appearing on the horizon in the form of educational aids to the consumer. Stores throughout the middle west have been installing special bars with trained women to handle these so that the best ensemble creams, the most perfect blending of rouges for lips, cheeks and nails would be offered as a unit. The idea while not new is being presented in new settings, with smart mirror arrangements, new decorations of paint and fixtures and arranged as a bar, a circle, part of a counter, or even a square. From the acceptance and the crowds of women who stand in line to study and hear the words of wisdom from these demonstrators it would seem as if there is at last some attention being given to the person who pays all the bills.

LIPSTICK COLOR FASHION

Two predictions are made by leading buyers throughout this area, for in Minneapolis, Detroit, Duluth, St. Louis and Kansas City as well as Chicago, every cosmetic buyer anticipates that the blue-purple lipsticks will be discarded for summer in favor of that pure red which is in the flag. This is predicated upon the fact that with light summer cottons and a great deal of white being worn, this is the most flattering tone and also one which somehow indicates a coolness that the blue tones do not give. Incidentally the women buyers have predicted this and the men who haven't taken such a careful pulse and pressure reading say they certainly hope so. It seems the men are tired of looking at blue lips. Another tip on this is the comments which dentists are frequently heard to make to patients, that a pure red makes the teeth appear white and gives an all-around fresher appearance.

PERFUMES MOVING RAPIDLY

"Magnet For Men" was the reading on a display card in the window of Chas. A. Stevens & Co., and below it was grouped the smartest names in the catalog of perfumes. It acted as a magnet for women and sales soared. More perfume ads have appeared in the middle west since Christmas than were used for the holiday season. This may be due in part to the wide-spread celebration of Mother's Day. Featured were smelling salts and colognes. Graduations, and the celebrations of families for the men who were returning home, may have had something to do with this increase. Whatever the cause — and buyers agree these all played a part—there has been a handsome pay-off for the pages of ads used. Perfumes are moving in a greater volume than most buyers ever expected except at Christmas. Florals—as rose, gardenia and jasmine, are leading sellers.

Colognes are even more important, for many women prefer these in preference to the heavier scents. Then there are sales made of ensembled odors—the soap, smelling salts (oh, yes they are back and having a vogue), talcum, face powder, bath powder, bath oil, bath salts, cologne and perfume. And sales like that are being made by the alert gals who believe one should have a distinctive odor. Sachets can also be included in this listing of ensembles. Some such advertising is done for business wear and for dress. A smart idea. If you are one of those readers who think such a listing of fragrances is merely for the stimulation of a woman's vanity then listen to the growing sales in men's departments. Today these are reaching new heights.

DEODORANT SALES ACTIVE

When the deodorant idea began its wide-spread mission of freshness a few women induced their husbands to use the creams, etc., for its freshness. But no man would buy it. So it was the little woman who had to buy for two (she did this after she discovered he was pilfering from her stock and leaving the jar empty and not mentioning it). Today there is a change. Forward thinking stores are placing a complete men's department of toilet goods in the men's section and the sales are moving upward so fast that buyers are being left breathless and minus the merchandise they need.

The counters installed in men's sections are active. So far it is the stores that cater to men, and a few of the specialty shops, which have a man's bar where both men and women may buy. Outstanding in sale are deodorants, all types of hair preparations from liquid to the creme shampoos and the latter are having an excellent acceptance from the men. There are the sportsman's types of colognes and after shave lotions, all the shaving beauty aids, powders, creams, etc., and among the most active selling items are the bath oils. In the women's departments small bottles are shown. But not so in the men's sections. Sixteen-ounce bottles sell readily and some buyers predict that while women are trying to make up their minds about the use of a bath oil the men will have cornered the market.

Reference has been made to the masculine acceptance of the bath oils but during the past month these have

been placed in open display for women. Water is so hard throughout most of the region that anything to soften it will be readily sold. Bath salts are still popular and probably will remain so—especially since some of the stores are suggesting these be used in the water where fine lingerie is washed to (1) soften the water and (2) give the underwear the whiff of perfume that the salts leave.

The presentation of bath oils still are in the high-priced range and while a few drops in the tub and a few more drops on the body are highly stimulating to the skin and its smoothness, many women have passed them by as too expensive for daily use. But this is a trend which may well be watched for as more and more of the leading firms come out with these and make them counter displays there is bound to be competitive selling. Manufacturers still lack trained demonstrators, one hears from the stores, so this may be one reason why the folding money class have missed this bit of luxury.

Popular priced stores do carry a few bottles but they report sales are slow and people not interested. Some day a smart store will have a doll's bathtub and some water to prove the effectiveness of the oil, but this will probably be a post-war theme. Today the average store needs to promote this merchandise and to attempt to sell more than has been allotted to make it popular.

LEG MAKE-UP SEASON HAMPERED

Information as to whether this is to be a leg make-up season or not. Middlewest weather has been so cold all through May that sales were virtually nil, yet counters in every leading city were staked with leg make-up. If it is not accepted, and only a suntan given by Old Sol is used by the bobby-sockers, a good many stores will have enough to start next year's season. At this writing most buyers are more or less biting their nails. They can do nothing about the weather and there has been so much rain that no leg make up could have endured the strain of pellets of water that came like young hail against bare legs.

ENSEMBLE SELLING STRESSED

The most interesting comment which buyers have to offer these days is that when they display merchandise in conjunction with national ads run in any of the papers, there is a quick sell-out. Now every buyer likes to think his ads draw the business—they do to one store—but as all of them feature the national brands, in order to maintain their allotments and make it easy for the inexperienced help back of the counter to sell, such cooperation is putting the department well ahead of its quota for the first half of the year.

National advertising stresses the smartness of ensemble selling. It has done a great deal to push this over and some women have stated that this is the first post-war idea they've seen that had direct application to them. For years stores featuring styles have tried this idea but as it did not click the first week, gave it up—for it was always a sale theme. Today the advertising is institutional and the Institution of Style Stores is capitalizing on the idea. Prices are often mentioned but usually a store such as Dayton's in Minneapolis featuring 6 brands, Marshall Field & Co., 14; Sears, 9, and Walgreen (national ads and brands), 19, gives some indication of the trends to him who reads.

WANTED: EYE COSMETICS

Mascara and the brushes for this are in great demand. The same is true of eye shadow but these are still among the war casualties.

Measuring Taste and Smell

Man has learned that various phenomena which affect his senses can be detected and sometimes measured and recorded in other ways. Devices, instruments and machines have been produced to do this work and in many cases they are more delicate than the sense organ in Man himself. The photographic plate will not only detect and record the incidence of light on it, but in some respects will do it more efficiently than the human eye; it will record stars that are invisible to the eye. The selenium cell will generate an electric current when light falls on it, and this current can be measured with suitable electrical equipment. The thermo-couple will detect heat by developing an electrical potential difference and this is used as the basis of pyrometry. The ordinary mercury-in-glass thermometer detects temperature changes by the differential expansion or contraction of the mercury relative to the glass. The microphone detects sound and the gramophone records it. Touch or pressure differences can be detected by the barometer or by gauges. Phenomena to which Man's senses do not respond are also liable to detection by instruments; the compass needle detects a magnetic field; the photographic film is sensitive to ultra-violet and infra-red light, vibrations to which the eye does not respond; the fluorescent screen is sensitive to X-rays, as is also the photographic plate; the microphone records sounds beyond the aural range.

It is strange, therefore, that there should be no instrument available for the detection and recording of the phenomena that stimulate our other two senses, taste and smell.

Sulfonated Fatty Alcohols

The Victorian Chemical Co., Pty., Ltd., Australia, became interested in 1935 in the manufacture of sulfonated fatty alcohols. An agreement was reached with Bohme Fettchemie of Chemnitz, Germany, under which the Australian company formed a subsidiary for the production of fatty alcohols in Australia from German raw materials. This arrangement continued until the outbreak of war in 1939, when the concern, known as Sardinol Chemical Co., was liquidated.

With the experience gained from collaboration with the German company and from its own laboratory experiments, the Victorian Chemical Co. began to operate independently and was able to meet to some extent the demand for the product, using materials from the United States and the United Kingdom.

Research has continued, and the company now plans to manufacture a product using only domestic raw materials.

Fuel from Camphor Oil

It is reported that China has found a new use for the camphor oil stocks which have been accumulating due to the impossibility of disposing of it through export. W. Mackenzie Stevens, of the State Department, says it is being used as fuel in automotive and other combusion engines.

A Survey of Spanish Essential Oils

Civil War in Spain decreased the production of spike lavender oil to such low levels that France began its distillation . . . Under normal conditions the French oil does not compete successfully with the Spanish product

by DR. ERNEST GUENTHER

Chief Chemist, Fritzsche Brothers, Inc., New York, N. Y.

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SINCE World War I Spain has become a heavy producer of essential oils, viz., spike lavender, rosemary, sage, thyme, origanum, pennyroyal, eucalyptus, marjoram, rue, cade and orange. Large quantities of these oils were yearly exported mainly to the United States and the United Kingdom, to a lesser extent to France, Germany and other European countries to be used primarily for the scenting of soaps, in medicinal preparations, for the flavoring of food products, and for technical purposes in general.

The outbreak of the Civil War in Spain, which lasted from 1936 to 1939, changed the picture insofar as the producing regions became zones of combat and most of the male labor was drawn into the actual conflict. Production of Spanish essential oils, therefore, fell to very low levels and prices rose correspondingly. Since 1940, however, Spain has been recuperating rapidly from the painful wounds of the Civil War and production of essential oils returned to normal figures. Indeed, World War II proved to be a most powerful incentive for further expansion, and oils like pennyroyal, eucalyptus, rue and orange have never been produced in such large quantities as during the period of 1940 to 1943. These activities were encouraged by the heavy demand on part of the European countries, primarily Germany during the height of her expansion. Prices rose to very high levels, causing more and more production. In 1943 exports started to decline slightly. Today with the end of hostilities in Central Europe the picture is changing again. The United States is showing renewed interest in Spanish essential oils, shipping has become easier but we are today confronted with much higher prices of Spanish essential oils than prevailing before the outbreak of World War II and before the Spanish Civil War because wages and general cost of living in Spain have increased substantially and the Spanish Government is establishing export prices. No one can predict the future development in regard to these oils as so many factors, such as, government control of the national economy, exchange rate, ceiling prices in the United States, controlled prices in Spain, etc., enter into the picture.

In the following pages we shall try to give a true picture of the Spanish essential oil industry as it stands today after nine years of a devastating Civil War and a European War.

First in a series of articles on the production of Spanish essential oils.

Oil of Spike

BOTANY

Spike or spike lavender, *Lavandula latifolia* Vill. (*L. spica* D.C.), resembles lavender but grows somewhat taller (80 to 90 cm.). The color of the flowers is grayish rather than bluish. The volatile oil contained in the flowers possesses a lavender-like odor, but sharper, more camphoraceous. It can be obtained by steam distillation.

HABITAT AND RANGE

Because of its 30 to 40 cm. deep root, spike lavender prefers alluvial soil, but as a relatively hardy plant it thrives well even in dry lime soil, on arid sun-exposed hills and slopes up to 700 m. altitude. Spike thus flourishes wild and abundantly over wide areas, but only in certain sections, of some of the temperate countries bordering the western Mediterranean, especially in Spain, also in Southern France, and to a much smaller extent in Italy and Dalmatia. Owing to the ample supply of wild growing plant material and the low price of the oil prevailing in normal times the plant is not cultivated in those countries. The growing regions in Spain which country supplies the bulk of spike oil, in fact since about forty years holds practically a world's monopoly in regard to the production of this oil, are located in Cuenca, Guadalajara, Soria, Granada, Teruel, North Jaén, Albacete, Jaén, Murcia, Castellón, Southern Cuenca, and Northern Almeria. The classification of these regions is made according to importance of production and even more according to the quality of oils originating from the various sections. Details will be found under Physicochemical Properties of spike oil. It remains problematical whether the difference in the quality of the oil is caused by botanical variations of the plants or by local conditions of soil, climate and altitude. No detailed botanical study of *Lavandula latifolia* as growing in Spain has of late been undertaken. Even if distinct varieties or forms should actually exist, the native collectors would never be able to differentiate between them and to gather only a selected variety. This, by the way, holds true of most Spanish aromatic plants.

A Typical Spanish Field Still

Quenca, Center of Spike Oil Production

As spike flourishes over wide areas of Spain's arid interior, remote from the cities and large villages, the collecting of the plants presents considerable difficulties. The cutting of spike, like that of other aromatic plants, is a tedious, "backbreaking" task. It requires sturdy men and women to stoop for endless hours in the burning summer sun of Spain cutting with a sickle the scattered herb, to carry the heavy bundles until they can be brought on donkeyback for miles and over steep paths to the nearest distillation post—and all that at extremely low wages. It is possible only because of the general poverty, the lack of other work and the low standard of living prevailing among Spain's rural population up to the Civil War, and to a large extent even today.

DISTILLATION

Since in Spain's interior good roads are nonexistent, the plant material cannot be carted or trucked to centrally located distilleries; in other words the distilling apparatus must be installed in the fields where the plants grow, movable field stills of simple construction being employed for this purpose. Oil of spike, like most essential oils in Spain, is produced by large operators and exporters located in Sevilla, Barcelona, Malaga and a few other cities. The organizing of a distillation campaign previous to the harvesting imposes a problem which almost follows the pattern of strategy: careful selection of proper sites with an assured and abundant supply of plant material and access to water for distillation which is not always readily available in Spain's arid interior; hiring of good reliable labor which cannot be regularly controlled and supervised; entrusting experienced, honest foremen with each post; transporting of hundreds of stills, condensers, drums, etc., to the interior—all this requires most careful planning lest the whole campaign is doomed to failure. The problem is aggravated by the fact that in many regions several distilling organizations usually compete for the flower supply, one outbidding the other when contracting with the harvesters in the small villages. And last, but not least, during normal times prices of Spanish essential oils had always been low and highly competitive.

Once a distillation post is established the foreman takes charge of it; he must be provided with sufficient funds to pay cash for the arriving plant material, after it has been weighed. Upon his honesty and experience the exporter has to depend: the foreman controls the yield of oil, could easily deceive his employer who visits the distillation post only once or twice, when making his rounds during the campaign.

The crew camps for weeks and months near the stills, sleeping under a shed without any conveniences or distractions. The work goes on day and night, without interruption, as huge quantities of plants must be processed during the height of the season. Four men handle the work of one post.

TWO STILLS REQUIRED

One distillation post consists usually of two stills; while one is in operation, the other one is being emptied of exhausted plants and recharged with fresh material. The stills are of simple construction, made of sheet iron, 2 m. high and 1.2 m. wide in the case of spike lavender, rosemary, sage and thyme, each holding from 30 to 40 arrobas (1 arroba = 11.5 kilos or about 25 pounds) of plant material. In the case of eucalyptus, origanum, pennyroyal and rue the stills are 2 m. high and 1.6 or 1.8 m. wide, holding 70 to 90 arrobas of plant material. They are half imbedded in the ground, usually on a slope, with a "firebox" dug into the ground beneath the still. Spent and sun-dried plant material serves as fuel. A perforated grate inserted 15 cm. above the still bottom prevents "burning" of the plants due to direct contact with the lower still walls surrounded by open flames. The condenser, usually a long pipe, is sunk into a brook, or waterhole. After being dried for some time in the sun, the plant bundles are charged into the still, tramped down and sufficient (about 200 liters or more) water is poured into the still to fill the space between still bottom and grid. The time of charge lasts thirty minutes, and another thirty minutes are required to get the steam up and start actual distillation which ends after two hours. Thus complete distillation of one charge requires three to four hours in the case of spike lavender, rosemary and sage when 100 to 120 liters of water have distilled over; five to six hours with thyme when 140 to 180 liters of water have come over; six hours with eucalyptus, rue and pennyroyal when 200 to 240 liters of water have distilled over; and nine hours in the case of origanum with 240 to 300 liters of distillation water. The length of distillation depends evidently upon the intensity of the fire, the efficiency of the condenser, and the condition (fresh or dried) of the plant material. Distillation completed, the still is emptied and recharged. Two to six charges, according to the plant material, can

thus be completed within 24 hours. The oil is collected in a simple separator, decanted from the distillation water and collected in drums which, when filled, are transported to the nearest village and from there to the warehouses or the exporters in town. Their task is to filter and analyze the oils and make up bulkings for the export trade.

YIELD OF OIL

Ten arrobas or 115 kilos of spike plants yield on the average one kilo of oil (about 0.88 per cent), the yield varying considerably with seasonal and weather conditions.

It is quite possible that this yield could be increased in more efficient stills, for instance, in direct steam stills. Studying the effects of direct steam distillation and water distillation on French spike plants Schimmel & Co.[1] obtained a yield of 1.1 per cent in the first and only 0.98 per cent in the second case.

DISTILLATION

The explanation is probably that in the present-day Spanish stills, the lower part of the plant charge often becomes soaked with water, especially when the stills are not provided with grids as is frequently the case in Spain. The plant charge, especially towards the bottom, agglutinates, forming a heavy mass through which the steam can no longer penetrate uniformly and forms a few channels. It is then very difficult, if not impossible, to exhaust the material with low pressure steam. The relatively long time (three hours) required for one charge in the Spanish stills seems to lend support to this theory, lavender plants being exhausted in France with direct steam in less than one hour. The method employed in Spain is actually a "water *and* steam distillation" which gives good results only if the plant material is separated completely by a grid from the boiling water beneath. If not properly carried out, the method suffers from the drawback of frequently incomplete exhaustion and low yield. The advantage of water *and* steam distillation, on the other hand, lies in the better solubility of the oils, and in fact Spanish spike oils show good solubility.

PHYSICO-CHEMICAL PROPERTIES

As pointed out, Spanish spike oils may be classified into three groups, distinguished by their properties:

1. Best quality distilled in Cuenca, Guadalajara and Soria, i.e., mostly at high elevation in the interior provinces.

2. Medium quality distilled in Granada, Teruel, North Jaén and Albacete.

3. Inferior quality distilled in Jaén, Murcia, Castellón, Southern Cuenca, Northern Almeria, i.e., mostly at lower elevation in the provinces along the eastern coast of Spain.

Genuine oils distilled under the author's[2] supervision in various parts of Spain and analyzed in the laboratories of Fritzsche Brothers, Inc., had the following properties:

Spanish spike oils of best quality possess the following properties:

Specific Gravity at 15°	0.900 to 0.905
Optical Rotation	Inactive or laevorotatory up to —5°
Total Alcohol Content, calculated as Linalool	35 to 40%
Solubility	Soluble in 3 vols. of 65%, alcohol and more

Oils of lower quality vary between the following limits:

Specific Gravity at 15°	0.910 to 0.920
Optical Rotation	Slightly dextrorotatory, up to +8°
Total Alcohol Content, calculated as Linalool	Around 30%, as low as 25% with increasing specific gravity and dextrorotation
Solubility	Soluble in 2 vol. of 70% alcohol

These figures show that a lower specific gravity and a higher laevorotation indicate a better quality of oil, approaching in this respect the properties of lavender oil.

Shipments of genuine Spanish spike lavender oils received during the past years and analyzed in the New York laboratories of Fritzsche Brothers, Inc., had properties varying between the following limits:

Specific Gravity at 15°	0.899 to 0.911
Optical Rotation	—7°25′ to +1°9′
Refractive Index at 20°	1.4643 to 1.4679
Total Alcohol Content, calculated as Linalool	34.0 to 38.5%
Ester Content, calculated as Linalyl Acetate	2.0 to 2.6%
Solubility (best grade of oils)	Soluble in 3 to 4.5 vol. of 60% alcohol; clear to opalescent with more

ADULTERATION

Adulteration of Spanish spike oils is a frequent practice, caused mostly by unreasonable price demands on the part of buyers. A great variety of adulterants, for example, steam distilled pine oil, fractions from the manufacture of terpineol, fractions of Spanish sage oil, of eucalyptus and camphor oil permit the sophistication of a spike oil in such a way that it meets routine analytical tests.

During the years from 1928 to 1936 the total production of Spanish spike oil fluctuated between 80 and 125 tons yearly; the outbreak of the Civil War in Spain, however, reduced this quantity to about 20,000 kilos in 1937 and 12,000 kilos in 1938. The forthcoming production of summer 1945 may be estimated at about 100 tons. It might be mentioned on this occasion that because of the decreased production in Spain during the Civil War, France again started to distill spike oil, supplying in 1938 about 18,000 to 20,000 kilos. Under normal conditions, however, the French oil cannot expect to compete successfully with the Spanish product.

[1] *Ber. Schimmel & Co.* 1908, 120.

[2] "Spanish Essential Oils," *Am. Perfumer*, May 1929, 161.

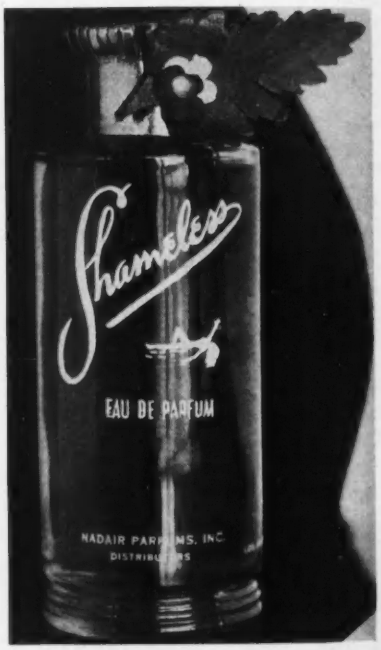
Place of Distillation and Province	Spec. Grav. at 15°	Opt. Rotation	Solub. in 65% Alcohol at 20°	Total Alcohol Content	Ester Content
1. Guadalajara	0.901	—2° 56′	In 3 vol.	40.6%	2.6%
Palomera, best quality of Cuenca	0.900	—4° 35′	In 3.5 vol.	37.5%	2.0%
Ditto	0.901	—4° 54′	In 3.5 vol.	37.8%	2.4%
Campillo, regular quality of Cuenca	0.908	—1° 53′	In 4 vol.; turbid with more	32.6%	2.3%
2. Huetor Santillon, best quality of Granada	0.905	—2° 18′	In 3 vol.	35.6%	1.8%
Granada, regular quality	0.904	—2° 20′	In 3 vol.	36.7%	2.1%
3. Moral (Canada de la Cruz), Murcia	0.908	+0° 34′	In 3 vol.	35.7%	2.7%
Regular Quality of Murcia	0.908	—1° 6	Clearly soluble in 4 vol. 65% alc. at 25°; not perfectly clear in 4.5 vol. at 20°; cloudy with more	32.6%	2.4%

(Editor's note: This article will be continued in the next issue.)

Packaging Portfolio

NADAIR PARFUMS

NADAIR PARFUMS: Shameless is something quite new in fragrances. It is more potent and more lasting than cologne and not quite as heavy as perfume. A gold kid crown and a green suede fig leaf accent the smartness of the bottle. It comes in two, four and eight ounce sizes.



EDEN COMPANY

ELIZABETH HARTLEY: Garden of Eden perfume and eau de cologne is presented in a newly designed package which depicts the Garden of Eden. The perfume comes in a one ounce crystal bottle; the eau de cologne in a four ounce bottle, capped with plastic and tied with a pink bow.

ELISABETH RAE-LAMONT

ELISABETH RAE-LAMONT: Sheertone, the rainproof liquid make-up, now comes packaged in a trim little compact. It has all the qualifications of the original product, plus the convenience of the compact package which eliminates the hazard of spilling and breakage. The smart plastic case holds 30 or more pairs of stockings.

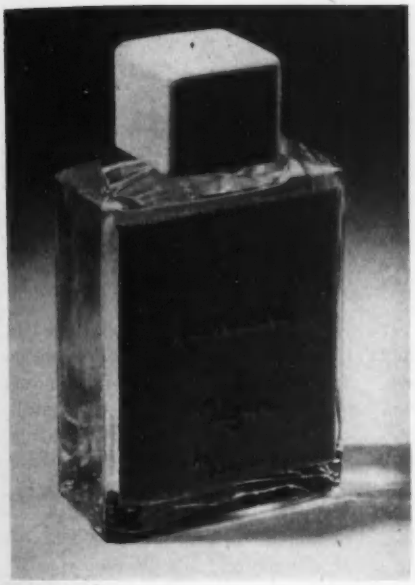
HARRIET HUBBARD AYER

DERMETICS

DERMETICS: The entire Dermetics' beauty program is tucked into this neat and most compact little felt week-end kit. It takes scarcely any room in an overnight bag and contains, in miniature, everything one needs for skin care . . . a cleanser, an oil, and a refreshing red lotion, which combined with the complexion dress gives the softest protection under one's make-up.

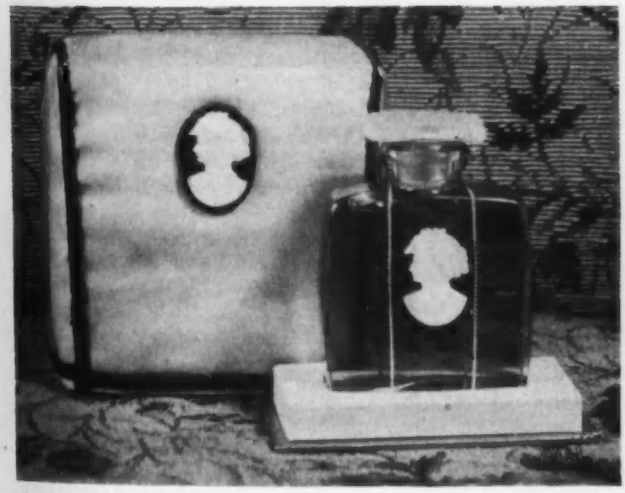
TUVACHÉ: Algiers Skin Perfume is created exclusively for perfuming the body. It is not a cream cologne nor a toilet water, but a liquid perfume product that leaves the skin soft and fragrant. It comes in a crystal bottle which has a suede label with the tradename in gold, and is capped with a porcelain top.

HARRIET HUBBARD AYER: Ayer Dry makes its entry into the anti-perspirant-deodorant field, packaged in a stock jar with the smart Harriet Hubbard Ayer label. A delicate cream which stops perspiration and deodorizes as well, it is said to be non-irritating and can be used immediately after shaving.



TUVACHÉ

LE JEUNE



LE JEUNE: Cameon is a new type perfume styled especially for evening wear. The sparkling one ounce flacon is mounted on a white and gold base. Its cover carries out the same cameo motif as the bottle, trimmed in white and black.

HOUSE OF IMPERIALE RUSSE: A novel way of applying fragrance is presented in Flower Petals. Fifty large petals of tinted cloth, saturated with refreshing, cooling flower scents, come in an attractive glass jar. The Imperiale Russe crest in gold is prominently placed on the black cover, which completes a most striking package.

HOUSE OF IMPERIALE RUSSE

Survey of Recent Cosmetic Patents

Registered Agent before the U. S. Patent Office discusses U.S. and foreign patents . . . Any inquiries relating to patents and trade marks will be met with prompt attention . . .

by I. J. FELLNER, Ph.D.

Cleansing mass. Daniel C. Luse, Chicago, Ill. *U. S. 2372838, April 3, 1945.* A cleansing composition is produced in the form of a rigid porous dry pressed mass to be held in the hand and rubbed over the surface to be cleaned, by combining approxtmately 9 parts of finely divided magnesite, 2¼ parts of finely divided clay and 24 parts of 18 deg. to 20 deg. magnesium chloride water solution, mixing the resulting mass for providing a mineral binder, introducing into the mineral binder approximately 12 parts of wood excelsior, mixing, molding and pressing the resulting mass at 700 to 800 pounds per inch, allowing the molded mass to remain without handling after its compression for about 5 to 6 hours so that the chemical reaction between the magnesite and the magnesium chloride will produce sufficient heat to harden the mass, drying the final stiff product and incorporating a soap therein.

Fountain tooth brush. Le Roy Earl Walker, Mullen, Neb. *U. S. 2371936, March 20, 1945.* A tubular body has aligned elongated handle and flattened head portions. The bristles are attached to the underside of the head in transversely spaced longitudinally extending rows, one located adjacent each of the side edges of the head. The underside of said head portion is provided with a dovetail groove extending longitudinally thereof between the bristle rows, said groove being formed as to provide an abutment short of the outer end of the head and an inner abutment at the inner end of the head. The head has a plurality of dentifrice discharge openings at longitudinally spaced intervals in the bottom opening into the groove, an elongated resiliently flexible closure member having dovetail longitudinal sliding connection with the groove to lie flush with the surface of the head. The closure member is slightly shorter than the groove and has openings therethrough adapted to register with the discharge openings in the head in one position and to close said discharge openings in its reverse position, and a button depending from the inner end of the closure member for actuating the same.

Skin cleansing agent. Boehme Fettchemie, Germany. *French 679227, Feb. 17, 1943.* A water soluble polyglycol ether, consisting of a fatty alcohol with at least 10 carbon atoms and at least 6 glycol radicals is used. Example: An aqueous solution of the polyglycolether of the lauryl alcohol having 12 glycol radicals is spread onto the soot soiled hand and rinsed off.

Lipstick holder. Jan de Swart and C. Bland Jamison, Beverly-Hills, Calif. *U. S. 2371808, March 20, 1945.* The holder comprises a tubular housing having a longitudinal slot through its side wall and a carrier mounted to slide longitudinally in the housing. The carrier is provided with a bifurcated bottom end presenting two depending legs, a laterally and inwardly opening recess in each leg, and means for sliding the carrier including an arm laterally engageable in the slot, said arm having a right angle portion presenting trunnions rotatably disposed in said respective recesses.

Detergent. Colgate-Palmolive-Peet Company, Jersey City. *Canadian 426100, March 13, 1945.* A cream that contains as an essential ingredient a reaction product formed from a fatty oil, glycerine, and sulphuric acid.

Used as a shaving cream, the detergent is formed from 1 molecule of a fatty oil, 2 molecules of anhydrous glycerine and 3 molecules of fuming sulphuric acid.

When used in a toilet cream, the latter comprises a plastic emulsion containing water, hyleaginous material and a salt of a sulphuric acid ester of a polyhydroxy compound having at least one hydroxyl group thereof esterified with a fatty acid.

In form of a dental cream, the detergent's composition is as follows:

Sodium salt of the sulphuric acid ester of a fatty acid monoglyceride	1.2 p.b.w.
Water	14.4
Glycerine	28.2
Calcium carbonate	45.7
Starch	7.0
Sodium benzoate	2.2
Flavoring material	1.3

Odorless disinfectants. To I. G. Farbenindustrie, Frankfort on Main. *Danish 60318, Sept. 11, 1942.* The oximes of 2-chlorobenzol, chloroacetophenone, methylbenzal, and isopropylbenzal are used.

FLAVORS

Synthetic Materials for the Flavor Trade

Better effects obtained from recently developed esters . . . Increased use of aldehydes, ketones, ethers and compounds of more than one functional group

by MORRIS B. JACOBS, PH.D.

THE growth of the use of synthetic materials in the manufacture of flavors has been phenomenal. At the turn of the century, there were probably about eleven synthetic esters which had considerable use in the preparation of flavors. These were ethyl acetate, ethyl formate, ethyl butyrate, ethyl isovalerate, ethyl enanthate, ethyl benzoate, ethyl sebacate, isoamyl acetate, isoamyl butyrate, isoamyl isovalerate and methyl salicylate. Now over 200 esters have been suggested and a large number of these have been employed as flavoring components. Of course, many of the old time ester compounds are still used to a large extent but better effects are being obtained by the incorporation of the more "recently" developed esters. The same picture is true in the other classes of organic compounds. There has been a large increase in the use of different aldehydes, ketones, ethers and compounds of more than one functional group. Over 110 of these compounds have been proposed as flavor components.

CLASSIFICATION OF FLAVOR COMPONENTS

Durrans[1] has classified flavoring materials having a distinctive aroma into four categories:

1. Those occurring naturally such as lemon oil, sweet orange oil, etc.;
2. Substances isolated from naturally occurring flavoring materials, for example, eugenol, anethole, and citral;
3. Substances prepared synthetically but which also occur in natural materials used as flavoring agents, for instance, vanillin, coumarin, cinnamaldehyde and diacetyl;
4. Synthetic substances which do not occur to any significant extent as natural flavoring materials, as for example, *gamma*-undecalactone, ethyl phenylglycidate, ethyl methylphenylglycidate, *gamma*-nonyl lactone, amyl acetate and many others.

The fourth group is a most important group if not the most important in the synthetic flavor field. It is seldom realized how important this group is. The chemist can often improve on the natural product. This has been shown spectacularly in medicinal chemistry, as for instance. in the case of cocaine. It was found that only part of the cocaine molecule was responsible for the anesthetic action. From this knowledge the development of local anesthetics like procaine followed.

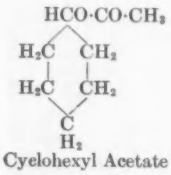
In the production of flavoring materials, less direct connection has been found between the structure of the flavoring materials and the development of new materials but some progress has been made. There has been relatively little interest shown in the characterization and isolation of the components of natural flavors because the discovery of substances with powerful flavor ability has served in many instances as adequate replacement. There is room for investigation in this field.

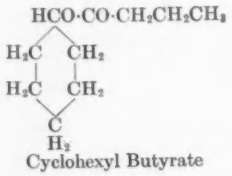
VANILLIN, COUMARIN AND ETHYLVANILLIN

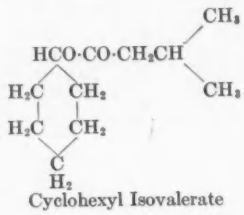
Very likely vanillin and coumarin are the principal synthetic flavoring agents used. Since the details of the synthesis and employment of these principal flavoring agents have been so often described there is no need for the repetition in this article. Bourbonal, so-called ethylvanillin, which is sold under many trade names, is also very well known. Bourbonal, 3-ethoxy-4-hydroxybenzaldehyde, is a solid with a vanilla-like odor which is about 4 times as strong as vanillin and is considered by some to yield an even finer flavor. It is consequently used as a replacement for vanillin in imitation vanilla flavors and in confectionery flavors. It has been synthesized from *o*-ethoxyphenol.

Some years ago it was noted that

the cyclohexyl esters were odorous compounds which were capable of being formulated into useful compositions. The principal esters of cyclohexanol used for this purpose are cyclohexyl acetate, cyclohexyl butyrate and cyclohexyl isovalerate. They are prepared by the customary esterification procedure using one mole of cyclohexanol and two mols of the corresponding acid and heating to 100-110° C. in the presence of 3-4 volume percent sulfuric acid. Cyclohexyl acetate has been suggested as a principal component in apple flavors; cyclohexyl butryate has been used for currant and peach flavors; and cyclohexyl isovalerate is recommended for apple, cherry, currant, grenadine, plum and strawberry flavors. When these esters are employed, they constitute a considerable portion of the flavor ester mixture in a manner completely analogous to the use of ethyl acetate or isoamyl acetate.

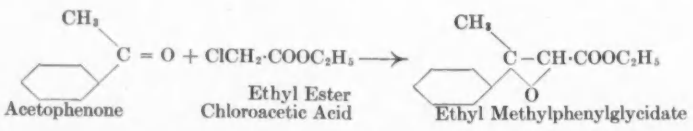

Cyclohexyl Acetate


Cyclohexyl Butyrate

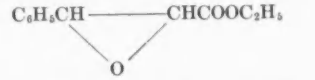

Cyclohexyl Isovalerate

ETHYL METHYLPHENYLGLYCIDATE AND ETHYL PHENYLGLYCIDATE

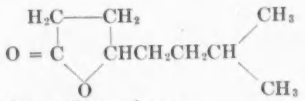
It is commonly considered that ethyl methylphenylglycidate is a new flavoring component. Actually this compound, which is possibly better known as strawberry aldehyde, and sometimes as aldehyde C_{16}, but which is more properly designated as ethyl *alpha,beta* - epoxy - *beta* - methylhydrocinnamate, was prepared by Darzens[2] in 1904. It has been used extensively since shortly after that time. Ethyl methylphenylglycidate can be made from acetophenone and chloroacetic acid ester. It has a somewhat fatty odor, consequently it can only be used in small amounts to obtain successful results.


Acetophenone — Ethyl Ester Chloroacetic Acid — Ethyl Methylphenylglycidate

Another of the strawberry aldehydes and considered by some authorities to have a finer taste than ethyl methylphenylglycidate, is ethyl phenylglycidate, which was concealed under the name of Aldehyde C_{16}, ethyl

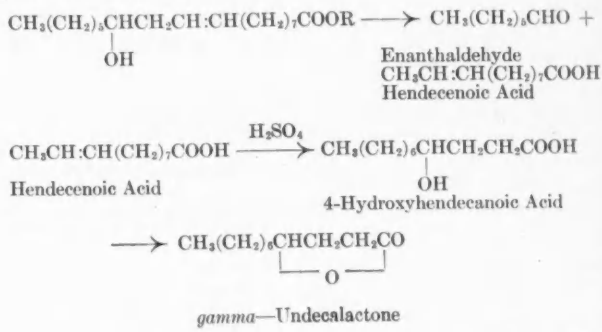


alpha - *beta* - epoxyhydrocinnamate. This compound has a tart taste and a strawberry odor and flavor and thus is satisfactory for inclusion in formulations calling for a strawberry note.


Isoamylbutyrolactone

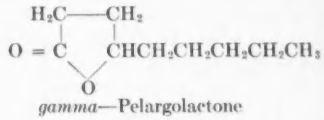
GAMMA—UNDECALACTONE

An exceedingly useful synthetic flavoring component is *gamma*-undecalactone, which is also known under the name of "so-called" Aldehyde C_{14}, peach aldehyde, undecylene methyl lactone, hendecylene methyl lactone, and more properly as *gamma-n*-heptyl butyrolactone. This compound also is not exactly even a recent addition to the flavoring field for it was prepared by Shukov and Shestakov[3] in 1908. The compound was then prepared commercially and hidden under the name of Aldehyde C_{14}. It is prepared from castor oil by destructive distillation with superheated steam. At first hendecenoic acid and enanthaldehyde are produced. By carefully treating the hendecenoic acid formed with sulfuric acid, the derivative 4-hydroxyhendecanoic acid is formed, by a shifting of the double bond and hydration, and from this compound *gamma*-undecalactone results by elimination of water.

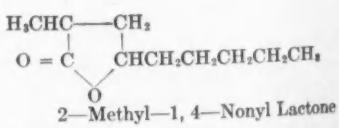

Enanthaldehyde
Hendecenoic Acid
4-Hydroxyhendecanoic Acid
gamma—Undecalactone

GAMMA—NONYL LACTONE

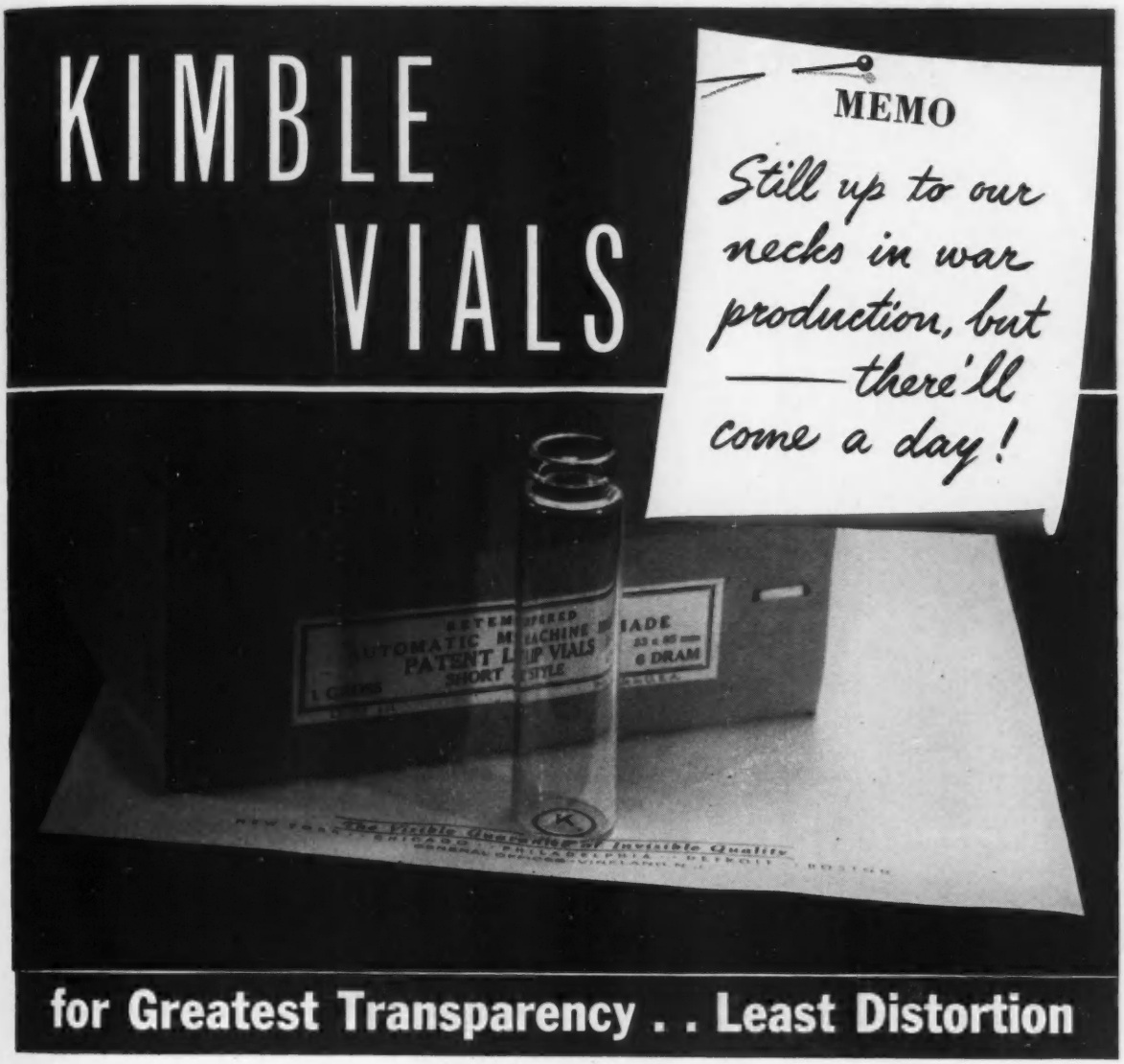
Two other lactones which have found some use in the flavor industry but not to the extent of gamma-undecalactone are the amylbutyrolactones, isoamylbutyrolactone and *gamma* - *n* - amylbutyrolactone otherwise known as *gamma*-pelargolactone and as *gamma*-nonyl lactone. These compounds have powerful fruity odors reminiscent of peaches. While *gamma*-pelargolactone was prepared by Blaise and Koehler[4] in 1909, it has found use only in about the past 15 years. These lactones can be prepared from the corresponding hydroxy pelargonic acid with 50-volume per cent sulfuric acid.


gamma—Pelargolactone

An analogous compound, 2-methyl-1,4-nonyl lactone was prepared by Blaise and Luttringer[5] as far back as


2—Methyl—1, 4—Nonyl Lactone

KIMBLE VIALS



for Greatest Transparency . . Least Distortion

This unretouched photograph of a Kimble vial, fabricated from machine-drawn Kimble glass tubing, tells its own story of how clearly this attractive type of container would display your product.

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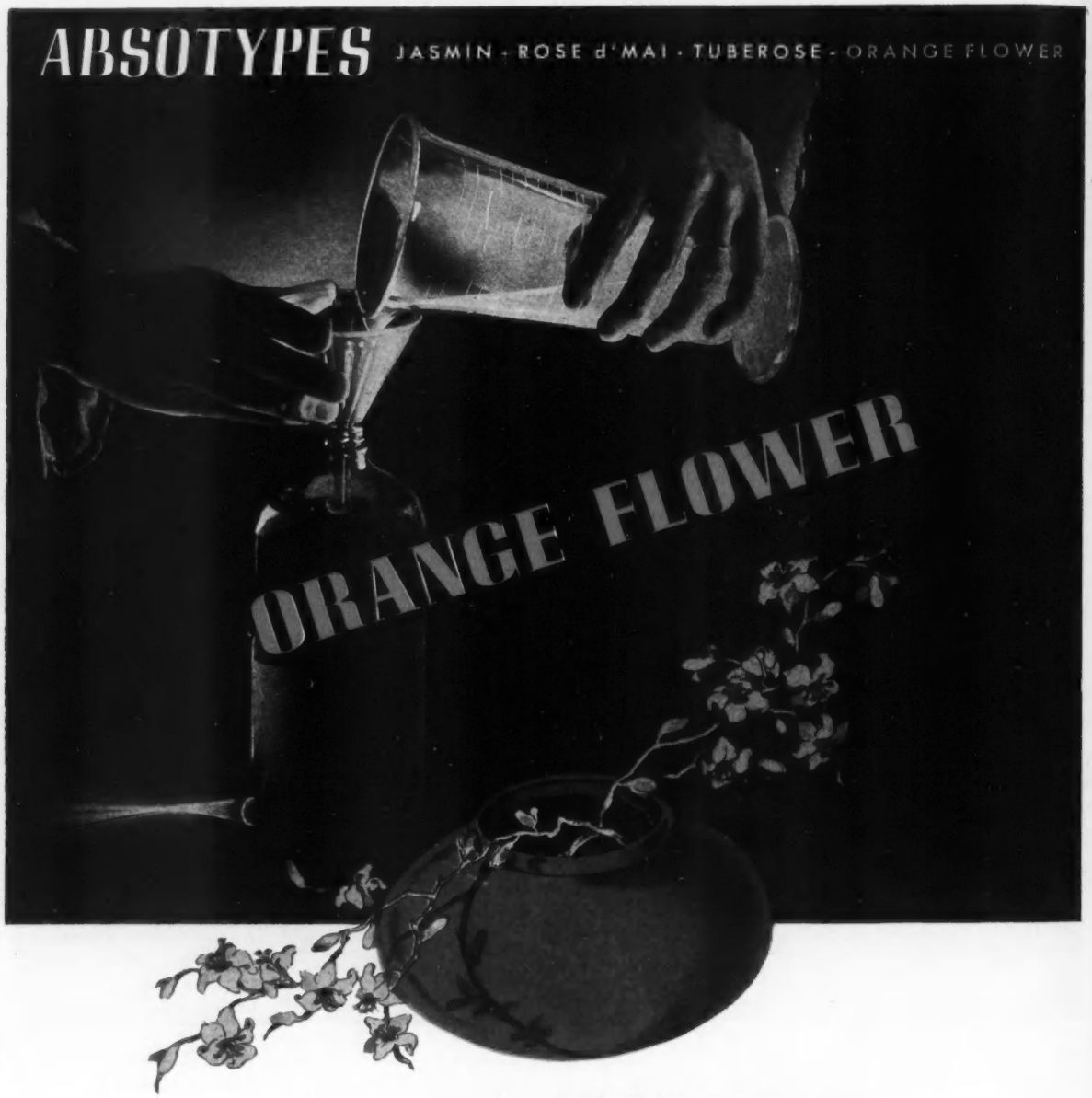

Amazingly faithful reproduction of the floral absolute that has established Florasynth ABSOTYPES as a distinctive family of primary essentials in the creation of superior perfumes and toiletries.

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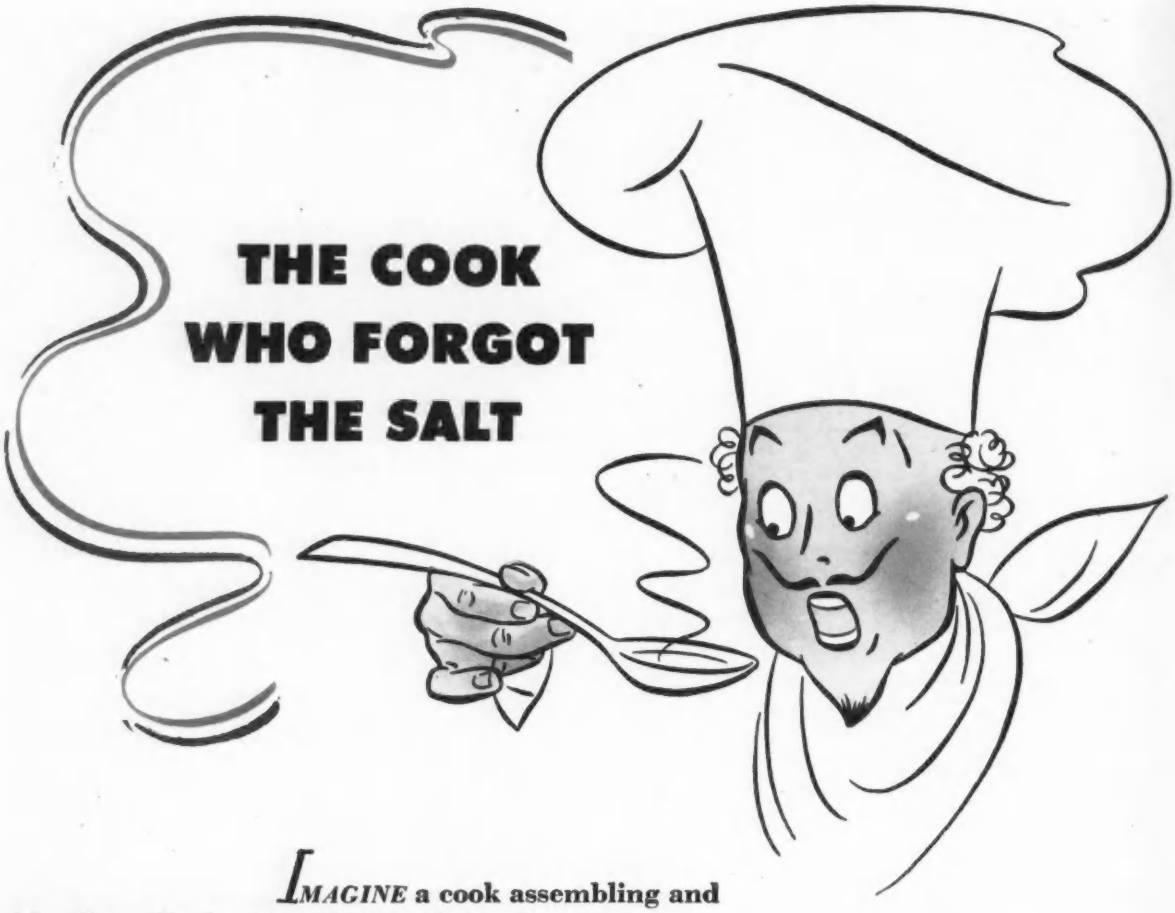
Florasynth Labs. (Canada) Ltd. — Montreal · Toronto · Vancouver · Winnipeg Florasynth Laboratories de Mexico S. A. — Mexico City

1905 but has found very little use. It has a minty odor.

DIACETYL

Diacetyl has been shown to be a normal component of the flavoring materials in butter, and thus actually belongs to the third group of the classification mentioned above. It is a volatile, yellowish-green, viscous liquid with a quinone-like odor when concentrated and assumes its agreeably butter-like aroma when diluted. It is often sold as a straight 20 per cent aqueous solution for flavoring purposes but is also used in formulations which are prepared for the bakery trade. Diacetyl has found some use in coffee and vinegar flavors. It is generally prepared by the oxidation of ethyl methyl ketone by several variations. In one method, the ketone is oxidized with nitric acid and the resultant isonitroso compound is decomposed. In another method amyl nitrate is used to form the oxime which is subsequently decomposed with sulfuric acid to diacetyl and hydroxylamine sulfate:

$$CH_3COCH_2CH_3 + C_5H_{11}NO_2 \longrightarrow CH_3COCCH_3 + C_5H_{11}OH$$
$$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\quad \| \quad\quad\quad\



THE COOK WHO FORGOT THE SALT

IMAGINE **a cook assembling and blending all the ingredients of a culinary masterpiece, and forgetting the *one* element without which it must taste flat, insipid and unappealing. Or, imagine a manufacturer scrutinizing every feature of a proposed package *except* the selling element.**

Perhaps no good cook ever forgets the salt, but many a group of highly intelligent executives, while laboring to procure a successful package, have slighted the *one* element without which NO package can help a product sell.

They have considered material, structure, production and cost . . . capacity to protect, dispense and identify the product . . . what sizes and shapes would be most convenient to handle, to stack and display . . . and have lost sight of the basic fact that, with all those essentials attended to, the *selling power* of a package STILL depends on *how the finished package looks!*

When Ritchie is called upon to design a package, Ritchie engineers and designers integrate *all* the multiple and complex factors involved to create—at low cost—a functionally efficient package that is *also* pleasingly attractive to the eye! That's why a Package by Ritchie *stands out!* That's why a Package by Ritchie SELLS!

THE 5 ESSENTIALS OF A SELLING PACKAGE

1. It must be practical, production-planned, economical to manufacture, easy to fill or pack.
2. It must fully protect and conveniently dispense the product.
3. It must be easy to handle, to stack, display.
4. It must *proclaim* the quality and identity of your product.
5. It must be notably "good looking," memorable, ATTRACTIVE!

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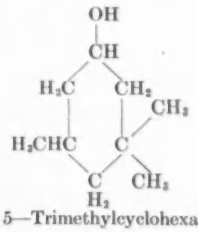
most important are musk ketone, musk ambrette and musk xylene. These compounds have found some use in Europe in berry flavors. It is doubtful whether their use is advisable since they are nitro compounds.

TRIMETHYLCYCLOHEXANOL

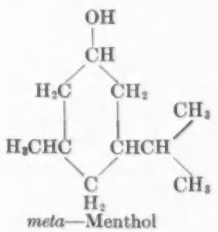
Trimethylcyclohexanol is a compound that is somewhat related to *meta*-menthol as can be seen from the formulas. It is also known as 3,



3, 3, 5—Trimethylcyclohexanol

3,5-trimethylcyclohexanol, 1-methyl-3-dimethylcyclohexanol, and cyclonol. It is an alcohol that crystallizes at about room temperature. It has a menthol-like odor and is capable of giving the cooling effect that is given by menthol. It has been used satisfactorily as a replacement for menthol in cosmetics and has been accepted by the U. S. Treasury Department as a denaturant for alcohol in place of U. S. P. menthol. Since this compound has only been introduced very recently there is little information available concerning its use as a flavoring agent.

This very brief description of the synthetics that are employed as flavor components only begins to describe the hundreds of odorous compounds that may be successfully employed. There is great need for a full description of such compounds and the author hopes to be able to present this description shortly.



meta—Menthol

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FEMA Committee Meeting

The Executive Committee of the Flavoring Extract Manufacturers' Association met in St. Louis, Mo., on April 5, to hold its third quarterly meeting.

The following members were present: President, Garret F. Meyer, William B. Durling, George M. Chapman, Clarke C. Nowland, E. L. Brendlinger, Leslie S. Beggs, Lloyd E. Smith, John H. Beach, John N. Curlett, Frank W. Green, L. P. Symmes, George M. Armor, George H. Burnett, Dr. Clarke E. Davis and executive secretary and general counsel John S. Hall. W. F. Meyer attended as a guest.

George M. Chapman, chairman of the Membership Committee, reported the following members having been admitted: Active members; Pixie Dixon Co., Gale-Staufer Co., and Charles R. Phillips Co.; associate members, Edward Remus & Co., M. Cortizas & Co. and Candy Industry.

George H. Burnett reporting for the Alcohol Tax Committee on a survey which had been conducted reported that a majority of the members favored a reduction of the tax on ethyl alcohol intended for non-beverage purposes to $2.25 per proof gallon.

It was voted to dispense with the printing of the annual report for the 1944-45 fiscal year.

FEMA Passes Up Election

Because of ODT regulations, and the general situation on travel, it was not possible for the Flavoring Extract Manufacturers' Association to hold its regular annual convention this year.

As a consequence, the officials of the Association, as well as members of the Executive Committee, will be maintained in office for another year without change.

Peppermint and Lemon Oils

Chief A. L. Kalish, Essential Oils Unit, WFA, made a tour of the Pacific Northwest to discuss distribution of peppermint oil and similar products, with the agriculturists and others of the region. It is growing more apparent that the largest regional yield of peppermint oil now comes from Washington and Oregon. Distribution has apparently been accompanied by some difficulties. The interest of the WFA is consistent with its policy to make food materials and materials for industrial uses in food production more available to the economy as well as to the ultimate consumer. The new acreage estimate on peppermint will be published the middle of June. It is not yet known whether more peppermint will be available or whether it must be put under allocation. The present supply is sufficient only to meet the existing allocation program. There is considerable lemon oil available for the United States in Italy. WFA and WPB are prepared to issue the necessary directive for its importation. But the actual arrangement for its procurement and shipment must be made by FEA. It is a strategic material. FEA has not apparently been able to send the necessary representative to Italy to make the arrangements. Its agent in Paris is unable to do the job because he has no authority to deal in strategic materials. Meanwhile, there is some apprehension that the lemon oil may logically be acquired by the British.

Vanilla Beans Expected

An encouraging development in the vanilla market is a report to the effect that a sizable quantity of Bourbon vanilla beans is nearby. It is expected that the shipment will arrive within a week or ten days, and this should relieve the exceedingly tight position on the spot.

While the exact amount is not known, some trade factors place the shipment at about two hundred tons. A second steamer is believed to have left Madagascar shortly after the first lots that are nearby, and it is understood that a considerable amount of new business has been placed for later shipment from the primary center.

The demand for Bourbon beans

has been quite brisk, partially because of the limited quantities of free beans from Mexico. The drought has continued in Mexico. The next crop is likely to prove a failure and trade factors do not hold out much hope of any relief in the Mexican vanilla shortage until the 1946-47 season.

Spice Kit Developed

A new kitchen spice kit containing 18 condiments and flavoring materials conveniently packed in a compact unit sufficient for 1,000 rations has been developed and is now being procured by the Quartermaster Corps.

The components of the pack are those most frequently used in cooking and are provided in proportions based on experience under combat conditions in the various theaters of operation. The contents include:

	Unit	Size
1. Baking powder	8	16 oz.
2. Baking soda	1	16 oz.
3. Bouillon cubes	3	90-100 cubes
4. Celery salt	1	6 oz.
5. Chili powder	1	4 oz.
6. Cinnamon (ground)	2	4 oz.
7. Cloves (ground)	1	1¼ oz.
8. Cornstarch	2	16 oz.
9. Garlic salt	1	6 oz.
10. Gravy and table sauce base	2	4 oz.
11. Lemon powder (synthetic)	1	12 oz.
12. Maple tablets	1	48 tablets
13. Mustard mix	4	4 oz.
14. Nutmeg (ground)	1	4 oz.
15. Paprika	1	1 oz.
16. Black pepper	6	4 oz.
17. Sage (ground)	1	1 oz.
18. Vanilla tablets	2	64 tablets
19. Yeast	1	6 oz. package

The pack is a revision of one originally designed for the invasion of France, the revision becoming necessary because, as the war progressed, and other theaters developed, it was found that the requirements in the widely separated areas differed so radically that the original kit would not suffice in some locations without the addition of extra shipments of some of the components. A study of these requirements resulted in the present standardized spice kit which is applicable to all zones. This has eliminated the extra handling necessitated in augmenting the original spice pack with extra quantities of various components.

Beside the usual spices and flavorings, two new components have been added to the original list. One is a dehydrated table sauce and gravy base which may be used as a seasoning or reconstituted into a table sauce. The other is a mustard mix which may be used either dry or reconstituted with vinegar into a well-seasoned mustard.

A 19th ingredient in the form of dehydrated yeast will be added to the kit in the near future, and will be available for inclusion as soon as facilities for dehydrating yeast, now being developed, are completed.

Each of the components of the spice kit are packed in metal containers ranging from 1 ounce to 1 pound. The entire kit is inclosed in a fiberboard box with inside dimensions of 13½ ins. by 10⅜ in. by 8 7/16 ins., the cans separated by corrugated fiberboard. The fiberboard box is inserted into a triple ply asphalt-laminated creped kraft paper bag, with a sealed closure, then overpacked in a nailed and strapped wood box, making a durable, moisture repellent package for overseas shipment.

Flavored Notes

"The use of artificial fruit essences in flavoring has grown rapidly of late years." This sentence sounds as if it were written very recently. It happens to be a quotation from *Treatise on Beverages* by Chas. H. Sulz which was published in 1888 by Dick & Fitzgerald in New York.

* * *

It bears repeating that the term flavoring extract must be strictly construed for the Food and Drug Administration has defined the term "extract." The vehicle, solvent or menstruum of a flavoring extract is ethyl alcohol of proper strength. Consequently, the terms "flavor" and "extract" are not synonymous for the latter term implies that the resulting product contains alcohol. Flavoring products prepared with solvents or vehicles other than alcohol may be labeled with the term "flavor" but even in this case the product which is prepared must contain the same type and proportion of flavoring components as the product prepared with alcohol. For instance, a "lemon flavor" should contain the same amount of flavoring material as lemon extract itself.

* * *

The proper use of synthetic, and, in fact, all coloring matters is a factor which is often completely ignored. In the preparation of a color solution or in the addition of color to a mixture, care should be taken to weigh out the amount of color exactly. This will enable a processor to duplicate his color shade every time. The use of a measuring device for the addition of dry color is not good practice for the apparent density of even the same coal-tar color varies considerably from batch to batch. *M. J.*

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by ARNOLD KRUCKMAN

THE amazing expansion in production by the toiletries and cosmetics industry is one of the experiences of the war years to which the people in the Chemicals Bureau of WPB refer as a milestone in the history of commercial chemistry. They often wonder why the industry itself does not put the piece to the music of good publicity. As it appears here, there is probably not another industry in the United States that has made such a record during the war, and has made the record in the face of such obstacles. The war cut off practically all the essential oils and other materials from Europe and Asia and Africa. It immediately cut into the manpower and womanpower of the industry. Chemicals were preempted for war and for essential uses. Equipment and facilities were devoted to civilian uses considered more essential. The industry itself started its war career with the handicap of being considered one of the most unessential civilian activities in a state of total war.

INDUSTRY CONTINUES TO ADVANCE

It is interesting to record that during the first quarter of the first war year, the man who was then head of the thing that budded into the powerful Chemicals Bureau told this reporter he had absolutely no fear about the commercial destiny of the toiletries, cosmetics and flavors industry during the war. "This industry," said he, "has the most ingenious and astoundingly adroit chemists in America. I think they will teach us things during this war. I doubt if there is a problem they will fail to solve, and I think they will solve their problems by means that also will expand their commercial fields. If I had my way I would grab most of the chemists in the industry, and I would put them to work in war laboratories to focus their extraordinary abilities on things for war.

"It is the present tendency (in 1941) to regard the civilian need for the products of these chemists as practically unessential. I think this is absolutely erroneous. And I think the industry itself will teach us that it is just as essential to the welfare of the people at the battle fronts and behind the battle fronts as are many other commodities we classify as essential."

The people in the Chemicals Bureau of WPB take tremendous pride in pointing out how the toiletries and cosmetics industry used whatever it could get and made of the materials synthetics; and how the industry has made these synthetics virtually a means of freedom of dependence upon foreign essential oils and chemicals. Some day someone in WPB will undoubtedly write the history of the development of many substitutes by the industry; and will tell the story how the industry sold the confidence in its essentiality to those who were in places of power. It should also be pleasing to the industry to realize that as a whole it probably gave less trouble and bother to the harassed people in WPB and other agencies than almost any other industry in the civilian economy. They tell you here that the makers of perfumes, powders, creams, flavors, and the many other things the industry produces, apparently simply dug in and produced—if not with one thing, then with another.

All this has point at the moment because there is much foolish hysteria about the terrible times ahead. In Government offices almost everybody knows someone who has some inside information about the efforts the Japanese are supposed to be making, through their Russian friends, to surrender. And these same Government people will tell you if the Japanese quit now we will go into a tailspin that makes them shudder. Obviously these Government folk have the jitters about their jobs. Without a war thousands of them will lose their jobs. Not particularly because there will not be Government jobs, but because veterans unquestionably will be given preferences in Government jobs. You also have heard that beginning with July, and during August and September, the expanding cutbacks will throw 6,000,000 persons out of war jobs. There is no doubt millions will lose war jobs during the next three or four months. Some sober estimates here are as low as 2,500,000. The most reliable and unemotional estimates place the figure at 4,000,000.

EMPLOYMENT AFTER THE WAR

But to get a proper perspective on the situation consider the relation of the war employment rolls to the normal civilian employment figures. The total number of men and women now employed in civilian jobs, war and non-war, is 51,200,000. In addition, approximately 10,000,000 men and women are in the Army and

Shortages in Strawberries, Raspberries and Cherries

FLAVOR manufacturers faced with the present shortages in fruit will find a solution of their problems with

Imitation Strawberry No. 21

Imitation Raspberry No. 75

Imitation Cherry No. 105

These useful products may be used to augment natural fruit flavors, to create greater strength or to stretch the effectiveness of natural flavor, or—they may be used with success just as they are without any additions.

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Navy. It is estimated if the war were to cease completely tomorrow, it would take the better part of a year before a third of these uniformed men and women would come back to civilian life. Some millions must remain in uniform while the war is being unwound in Europe and in the Pacific. Other millions will continue to remain in uniform because we will indubitably maintain for a considerable period a much larger peacetime Army and Navy.

Consider again that number of 51,200,000 now employed in war plants and civilian plants. Of that number there are employed in agriculture, on railroads, steel, other factories, in other unavoidable civilian production and distribution, and in retail jobs, and other jobs, at least 44,600,000. These jobs will continue regardless of war. This obviously means that 6,600,000 are employed solely on the war jobs; and it is common sense to realize that not all of these war jobs will dry up so long as there is any kind of war, and so long as we keep an Army and Navy ready for war. There are a number of munitions plants which will not close down, either wholly or partially, for a long, long time. It is really doubtful if as many as 5,000,000 workers will be permanently thrown out of employment when we return to what might be called a static peace economy. The number will be closer to 4,000,000.

Now consider those 4,000,000 or 5,000,000. No one knows exactly what proportion of the number are women, and how many are older people, and how many are professionals or persons who either have no ordinary reason to work, or who must go back to jobs for which they are trained that are now unfilled. It is considered here by sensible people that less than 2,000,000 of the war workers who will lose their jobs will seek other jobs. In other words, from 2,000,000 to 3,000,000 will go back into homes or into non-competitive vocations or avocations. Also, there are presently from 1,000,000 to 2,000,000 unfilled jobs. And bear in mind it will be at least a year, if the war stops right now, before 3,000,000 or 4,000,000 of the uniformed men and women come into the market. There will be among them a certain proportion who likewise will not look for jobs.

Whatever disturbance there is ahead will mainly be due to the shift from one kind of employment to another. That applies to factories as well as to people. In essence there are relatively only a limited number of plants which must reconvert. Many here think the chief problem may be conversion, the shift of the many smaller units which started with the war to peacetime industry with which they are unfamiliar, or in which they will be new competitors. Outside of the hysteria belt in Washington it is generally assumed the lowest ebb in unemployment may come next Fall.

NEW ORDER ON CANE ALCOHOL

Order L-348, which was brought under a strict control on May 7, was revoked less than a month later. This means importers of cane alcohol are no longer required to report to the Federal Government the exact quantity and the nature of the essences and other materials they propose to add to the alcohol and the mixtures they bring from the Caribbean. Toiletries compounders may again send to exporters in Puerto Rico, Cuba, the Virgin Islands, and other islands of the Caribbean, some of the ingredients of their compounds, and bring into the United States the alcohol base mixture legally as the basis for further processing in their own factories. This action is indicative of the gradual increase in supply of alcohol. The June supply is expected to be slightly better than in May; the quantity is expected to be about the same as it was last January. Chief John T. Batson of the Chemicals and Cosmetics Branch of the Chemicals Bureau of WPB is rightfully cautious about holding out hope for very much immediate improvement, but he does say the supply is not expected to diminish, and that there is more than a possibility the volume will definitely increase in the next few months. The general impression here is that the military requisitions will be cut back; and the information is that Russian lend-lease shipments have been stopped. Under President Truman there is a clear purpose to give the breaks first to the people at home. The principle was defined by his new Secretary of Agriculture, Clinton P. Anderson, in his Report on Sugar shortages, when he laid it down as axiomatic that the residue, hitherto supplied to Americans, should hereafter be given to the foreign beneficiaries. Isopropyl alcohol of 91 per cent grade, will be supplied to toiletries and cosmetic applicants in June on the basis of 75 per cent of the volume requested.

LANOLIN SITUATION TIGHT

Fats and oils apparently are diminishing in supply for industrial uses. No lanolin is available in June, nor is there any sign that there will be any available in the months immediately ahead. Red oil, which is extremely tight, again was placed under allocation on June 1, by an amendent to WFO No. 53. Set-aside and inventory limitations were eliminated. Delivery and use of the oil in quantities of 450 pounds, or less, in any calendar month, is permitted under general authorization. Saponified red oil also was placed under allocation. Stearic acid is difficult to obtain, but it has not been placed under allocation. Paraffin wax comes under allocation on July 1. The small order exemption permits any person to obtain 2000 pounds per month. A one-time use and inventory report is required of those who used more than 12 short tons in 1944. It is pointed out that raw, slop, or slack wax may be obtained without allocation. Department of Agriculture warns in 1945, with sharply reduced supply of fats and oils, domestic supplies will be reduced. The shortage will not be materially eased before late spring or summer of 1946. By that time some supplies may be forthcoming from the Far East. Inventories are being reduced during the current year to meet the large war requirements. By October 1, inventories may be the smallest, in relation to current needs, on record. Through its Office of Foreign Agricultural Relations the Department suggests a study of the potential values of candelilla wax, produced from a shrub which grows in Mexico. It may be mixed with other waxes, or with fats and other waxes, for compounds such as creams. Foreign Economic Administration announced it had agreed with the Argentine Republic for the purchase by the U. S. Commercial Company of exportable surplus vegetable oils and their products.

Lead is still diminishing in supply. WPB reports there is not cur-

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rently sufficient in supply to make bullets, batteries, gasoline, bearings, camouflage and for communications. If the cutbacks in July prompt workers to go West, the addition of some thousands in the mining areas of Utah, Idaho, Colorado, Arizona, and Nevada, will probably make sufficient metal available to provide material for non-essential civilian industrial needs. It is also hoped more labor after July may improve the difficulties that increasingly beset the glass containers industry. Late in May the Glass Containers Industry Containers Committee advised WPB to strictly enforce Orders L-103 and L-103-b which limit designs and specifications as well as products that may be packed in new machine-made glass containers. Inventories have been reduced by many gross. It is hoped the situation may be clarified not later than September. Any temporary embarrassments should be eased by the end of the third quarter. Sufficient steel is expected to be free during the third quarter to make more closures available, particularly if secondary steel is used. WPB points out that aluminum and plastics are expected to be much easier during the third quarter.

PAPER TIGHT

September also is expected to reveal whether or not more paper may be free to relieve the extraordinary lack of materials to make urgently needed paper containers of all kinds. Late in May WPB took extraordinary precautions to conserve all paperboard to meet increasing military requirements. Producers are required to reserve 50 per cent of their monthly output for the corresponding quarter of 1944. Paperboard is virtually reserved for Government orders. V-1 type boxes may no longer be made for war uses in order to conserve other types. The tightness of the supply of fiber shipping containers was demonstrated by WPB in the ruling that the use of any new "service carton" to ship empty glass containers must be charged against the packer if he uses the same carton to reship filled smaller packaging units. Solid and corrugated fiber sheets have been placed on the National Production Urgency List. Folding and set-up box problems will be discussed late in June at a meeting called by Paperboard Division of WPB. It is forecast the allocation for the third quarter will not exceed that of the second. WPB hopes there will be more woodpulp from Canada during the third quarter, and that Swedish woodpulp may begin to arrive by the middle of September, if shipping is available. There is also a remote hope that military cutbacks might begin late in September. FEA suggests materials are available for large production of ceramic containers in Italy if a small amount of raw materials for colors and glazes may be imported to that country.

ORRIS ROOT FROM ITALY

FEA has announced it is negotiating in Italy for substantial shipments of orris root, and has requested importers to advise the General Commodities Division, U. S. Commercial Company, Washington, D. C., how much they purchased from 1936 to 1940, inclusive; entry date of shipments, and entry number, if possible; port of entry; and where the shipment originated. Chile, apparently, is determined to bar cosmetics and toiletries manufactured in the United States, despite a long historic background in the relations between American exporters of these products and the importers in Chile. Recently Zande Cosmetics Co., Inc., of New York, was advised by its Chilean distributor that the distributor had been refused import permits, based on dollar exchange. Enquiry by the American Embassy revealed that the National Foreign Trade Council of the Chilean Government would not permit the importation of the American cosmetic products unless they are supplied in semi-manufactured form, or as raw materials. It is apparently mandatory that the cosmetic product be completed in Chile. To supply the molds and other equipment for the completion of the product, which must be obtained from Chilean sources, obviously made the transaction commercially unfeasible. Zande Cosmetic Co., Inc., therefore advised the American Embassy "we are compelled to discontinue the sale of our products in the Chilean market, to our own detriment, and to the detriment of our distributors." Similar experiences have been reported to the American Government by other exporters of toiletries and cosmetics to Chile. Compliance with Chilean Government requirements appear to be commercially impossible, as well as physically impossible in some instances. Various reports from American Government sources in Chile appear to indicate that practically no American cosmetic exporters are able to do any substantial business in the South American Republic under the existing regulations. The conclusion therefore is that if the American Government is unable to secure an adjustment for the relief of the American exporter, that it appears the Chilean Government has formulated its present laws to shut off American imports of cosmetics and toiletries. It has not yet been possible to discover whether or not French exporters, and exporters from other countries, are more successful in making the necessary arrangements. Apparently Chile is one of the beneficiaries of the recently revived Trade Agreements Act; and, undoubtedly, in common with other South American countries, Chile has participated in the various Good Will and Good Neighbor hospitalities which the United States has sponsored.

Treasury has issued General License No. 91 to facilitate trade and current transactions with Belgium. . . . The State Department has arranged that visas will be granted more promptly by French officials in this country to Americans who hold passports issued by the United States. . . . Parcel Post service to France was resumed on June 1. One parcel, weighing not more than 11 pounds, may be sent by the same person to one addressee in France each week. Parcels must conform to FEA regulations. . . . Foreign trade statistics again are issued by the Department of Commerce. Lists of publications now ready may be obtained at any local office of the Bureau of Foreign and Domestic Commerce.

Elmer Tysdal, long in charge of cosmetics and toiletries in WPB, left June 1, and is now production manager of the Pharma-Craft Corporation on West Hubbard Street, in Chicago. Fred Stock, head of the Division of which Tysdal's unit was a section, also left in June, and is now an official of the firm of Charles Pfizer & Co., chemists, in New York. Edward L. Marschner, head of the Medicinal, Chemicals and Vitamin Unit in the Division formerly headed by Stock, leaves WPB on July 1 to return to the Sterling Products Corporation.

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NEW PRODUCTS AND PROCESSES

Non-Saponifying Paint

Rubbermastic paint, developed and manufactured by Guaranteed Products, is claimed to be an improvement over pre-war rubber base paints. According to its manufacturers Rubbermastic paint can be applied to any surface, wet, damp or dry, painted or unpainted, and no etching or preparation is necessary.

Its cost is claimed to be 35 per cent less than pre-war rubber base paints. It may be applied to walls, roofs, or floors of concrete, brick, stucco, paper, wood or metal. Its welding qualities are reported to effect a vulcanized waterproofing job in colors.

Waterproofing Agent

A new war-tested liquid insulating agent, PiB, has been made available to the general public for the first time by U. S. Industrial Chemicals, Inc.

The product may be applied with a brush, or as a spray. Its makers claim that it is entirely different from other types of waterproofing materials, as it acts as a penetrant, rather than as a coating.

Gas Analyzer

The Hays Corp. announces the development of a special analyzer for treating the high purity of oxygen, carbon dioxide, and nitrogen in the range from 90 per cent to 100 per cent.

It is offered in two styles, a wall mounted model for permanent installation, and a portable model, supplied in a neat metal case with carrying handle. A junior model is also available (series EJ) with a burette capacity of 30 cc. An explanatory bulletin will be sent upon request.

New Veneer Coating

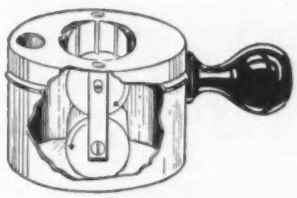
A new ready-mixed veneer coating for concrete, brick and stucco exteriors has been placed on the market by the Paint-Point Corp.

Applied with an ordinary paint brush, its makers state that it will seal cracks and leaky joints, and paint, all in one operation. It is of a heavy viscosity, and will cover approximately 100 square feet to the gallon. An approximate life of ten years is claimed.

Samples may be obtained free of cost, together with any information desired.

Marking Pot

This new patented marking pot, manufactured by Adolph Gottscho, Inc., is constructed with two rotary wooden rollers which convey the liquid marking ink from the bottom of the closed metal container to the top roller, and then to the stencil brush. As the bottom roller reaches almost to the bottom of the pot, ink is still available when the supply is almost exhausted.



Marking Pot

Since in this new marking pot the final amount of ink is used, and because there are two rollers which automatically stir the ink to prevent settling, there is no pigment accumulation on the bottom of the pot, and no thickening of the residue of ink left in the pot.

The marking pot is 3¾″ in diameter by 2⅝″ high, light in weight, and has a comfortable handle. The cover has the two roller assembly attached to it, which makes for easy removal and cleaning. There is an additional hole for marking brush use.

New Germicide

Givaudan-Delawanna, Inc., New York, N. Y., has developed a new germicide for which it claims the properties of being non-toxic and non-irritating. It is stated that the product retains its full bactericidal power when incorporated into soap. Various properties of the soap, such as pH, lathering power, odor, and detergency are unaffected in the presence of the new germicide.

The germicide, known under the trade name of G-11, is chemically 2,2′dihydroxy 3,5,6,3′,5′,6′ hexachloro diphenylmetane.

Book Reviews

FLAVOR. Ernest C. Crocker. 5½x8½ in., 165 pages, 33 illustrations. McGraw-Hill Book Co. 1945. Price $2.50.

The author, a consultant on the chemistry of flavor on the staff of Arthur D. Little Inc., has drawn on his experience and findings of workers in related fields in order to give a broad treatment of the subject, in both theoretical and practical aspects. It is intended to be of use to those concerned with problems of flavor or odor. An odor classification system developed by the author and L. F. Henderson is included. By this system each odor is classified by a four digit number, the digits indicating the relative concentration of the four types of odor components. It contains a new and enlarged table of volatile chemicals used in flavoring, arranged according to their volatility in 14 classes, which may be useful in operations involving blendings, evaporation control, fixation and partial identification of organic materials. Chapter headings include: The Elements of Flavor, The Physiology of Flavor Perception, Psychology in Flavor, The Language of Flavor, Natural Sources of Taste, Significant Elements in Popular Flavors, Essential Oils of Flavor Interest, Influences of Processing on Flavor, Flavor Changes in Storage, Organoleptic Technique, etc. A good bibliography adds to the value of the work.

AMONG OUR FRIENDS

▸ Luis deHoyos, general manager of Synfleur Scientific Laboratories, Monticello, N. Y., has returned from a trip covering the leading countries of Latin America, returning by way of Mexico. Mr. de Hoyos, who incidentally is mayor of Monticello, is well known throughout Latin America where he has made numerous business trips over the years and since the war made an important trip on behalf of the State Department of the United States. Mr. de Hoyos is much impressed with the general outlook for improved commercial relations with Latin America.

Luis de Hoyos

▸ Arthur Francis Connolly, son of Arthur Connolly, general manager of Helfrich Laboratories, Inc., New York, N. Y., has been commissioned a lieutenant in the U. S. Army, Engineers' Corps. His training was secured at Alabama University and Alfred University.

▸ Lieut. Jean R. Delavigne, son of Albert Delavigne of Roure-Dupont, Inc., New York, N. Y., has returned to Turner field after a week's visit to his parents. The cross country flight was made in a B-25. Lieut. Delavigne won his wings some time ago.

▸ Lieut. Fritz J. Polak, son of Jacob Polak of Polak's Frutal Works, Long Island City, N. Y., who has been on duty in the European theatre was recently promoted from second to first lieutenant.

▸ Doane Hage, New York representative for the Arthur Colton Co., has been notified that his son Sgt. Doane Hage, Jr., has been liberated from a German prison camp at Krems, Austria, and will soon be returned home. A letter from him states that he is in fine condition. His plane, of which he was waist gunner, was shot down over St. Nazaire, France, by flak; the nose and tail being blown off and the two right wing motors being shot off. The plane caught fire and plunged to earth killing four men who could not get out in time. The incident was described in an article in the *Saturday Evening Post*, April 24, 1943. Sgt. Hage was a prisoner of war for two years and reports that he was not subjected to forced marches.

▸ Rolendia Rodriguez, assistant export manager of Revlon Export Corp., New York, N. Y., has been visiting her family and friends in Rio Piedras, Puerto Rico.

▸ S. L. Mayham, executive vice-president of the Toilet Goods Association, is to speak in tribute to the Nation's cosmetic manufacturers on July 8. He will speak from Omaha, Neb., in one of the series of salutes to business and industry, "Your America," the coast-to-coast Mutual network program of the Union Pacific Railroad. Other program features will include music, an interview with a railroad employee, and a war story narrated by Elden Westley.

▸ Alexandre Tarsaidze is now associated with Esme of Paris, New York, N. Y., as director of sales. He was formerly vice-president of Prince Matchabelli, and president of Parfums Chevalier Garde.

▸ Mrs. Gladys de Maublanc arrived in New York on May 31 via American Export plane. Mrs. de Maublanc is the sister of Elizabeth Arden, and is the manager of the Paris branch of the cosmetic house. She stated that she had regained twenty-seven of the forty-seven pounds she lost while a prisoner of the Nazis for nine months. She had been incarcerated at Vittel. Mrs. de Maublanc said that the factory had been shut for six months due to lack of materials, and that as a consequence the Paris shop was almost bare. She hopes to have the factory running again by August.

▸ Kenneth Voorhees and Mrs. Voorhees have announced the birth of twin daughters, Patricia and Beverly, on April 12. Mr. Voorhees is executive vice-president of Ungerer & Co., New York, N. Y.

▸ Harris Whitaker has been appointed assistant to Arthur Mainzer, president of Mary Dunhill, Inc., New York, N. Y. He was previously associated with Bourjois, Inc., and more recently with Elizabeth Arden. He acted there as assistant to the president and merchandising manager.

▸ Fred J. Stock, chief of the drugs and cosmetics branch of the War Production Board, is leaving to act in an executive capacity with Charles Pfizer & Co., New York, N. Y. Mr. Stock was in charge of the prescription department of Walgreen Drug Co., Chicago, Ill., until he came to OPA in 1941.

▸ William A. Black has been appointed superintendent of Richard Hudnut, New York, N. Y., and will direct the activities of the Production Division. The experimental and applied research laboratories are also under his direction. Mr. Black came to William R. Warner & Co., Inc., in 1921 as a control chemist. Later he was in charge of pharmaceutical manufacturing, and from there was promoted to assistant plant manager.

▸ Robert E. Curran was recently elected executive vice-president of Charles of the Ritz, New York, N. Y. He came to New York in 1942 from the southeast territory where he was formerly manager.

▸ Dacy P. Watkins has joined Parfums Weil, New York, N. Y. He will cover the southeastern territory. He was previously associated with Lehn & Fink and the Labert Pharmacel Co.

▸ Claire Wander has been appointed advertising director of Volupte, Inc., and of Herb Farm Shop, Ltd., New York, N. Y. She was formerly associated with Helena Rubinstein, where she acted as promotion director.

ADVERTISEMENT—*This entire page is a paid advertisement.* *Prepared Monthly by U. S. Industrial Chemicals, Inc.*

U.S.I. CHEMICAL NEWS

June ★ A Monthly Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1945

Airco Export Corp. to Represent U.S.I. in Foreign Markets

Mr. Glenn L. Haskell, President of U. S. Industrial Chemicals, Inc., has announced that the newly formed Airco Export Corporation has been appointed the selling agent for U.S.I. in all foreign countries except Canada.

In anticipation of a greatly expanding export market, the Airco Export Corporation is directing an intensified program on the sale of U.S.I. chemicals, resins, and other related products.

Airco Export Corporation has opened new offices and display rooms at 33 West 42nd Street, New York. Mr. H. R. Salisbury has been named President of the new corporation. The world-wide coverage of the Airco Export Corporation provides the logical medium through which U.S.I. will make its bid for increased foreign sales of chemicals and resins in the postwar era.

Process Using Ethanol Lengthens Shirt Life

To produce an air-and-water permeable fabric for collars and cuffs which will outwear the shirt, the inventor of a new process proposes a multi-ply fabric impregnated and bonded with ethyl cellulose.

The fabric plies, alternating with layers of cellulose acetate film, are first sewn together to form an assembly. A solution of ethyl cellulose and ethanol is prepared, diluted with water, and the cellulose-fabric assembly is padded through the solution until the fabric is saturated. It is washed, partially dried, and the damp assembly is then subjected to a pressure of 100 lbs. per square inch between plates at 175 deg. C.

The smooth, stiffened fabric thus obtained is integrally bonded together and is thoroughly permeable to air and moisture.

An alternate process uses a di-ortho-xenyl mono-phenyl phosphate plasticizer with ethanol, and ethyl cellulose.

Wear-resistance of these new stiffened fabrics appears to be substantially higher than untreated fabrics, although wear-resistance is decreased by repeated washings.

Chemical Properties Altered By X-Rays

Quartz and other crystalline materials undergo changes in elastic constants and chemical properties when subjected to ultra-short radiation such as x-rays and cathode rays, and to deutron bombardment from a cyclotron.

Of immediate interest is the use of this technique in setting and modifying oscillation frequencies of crystals used to control radio and radar equipment.

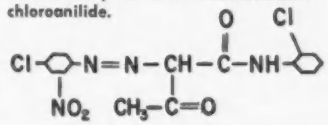
Since irradiation by the new x-ray technique greatly modifies the rate of solution and chemical reaction of crystals, it opens up a new field of photo-chemistry.

Bright Future Seen for Arylides in Making Improved Yellow Dyes

Use of Benzidine and Hansa Yellows Promises to Continue on Large Scale Despite Postwar Return of Chrome Yellows

Although the current shortage of metallic sodium has temporarily halted U.S.I.'s production of acetoacetarylides, the company looks forward to early and large-scale use of these intermediates in the synthesis of Hansa yellows and the newer benzidine yellows which have demonstrated both practical and economical advantages over the chrome yellows.

A typical "arylide" end product, Hansa yellow 3G. Diazotized p-chloro-o-nitro aniline coupled with acetoacet-ortho-chloroanilide.



Originally used as replacements for chrome yellows, these two yellows were found to possess several marked advantages over the unavailable chromes for which they were substituting. Printing inks made with the "arylide" dyes were more workable than those made with chrome yellows. Their greater tinctorial strength made brighter, clearer colors possible for pigmenting paper and protective coatings. This same high tinctorial strength also made the price differential between the new dyes and the chromes insignificant, for they go so much further than the chrome yellows.

Benzidine Yellows

Benzidine yellows are produced by combining tetrazo benzidine with acetoacetarylides. The yellow dyestuffs which result are non-bleeding in water, and in dilute acids and alkalies. In addition, they are fairly resistant to melted paraffin, alcohol and other common organic solvents except chloroform.

By varying the intermediates used, a great number of yellows can be produced having different characteristics of shade and fastness to various agents.

Hansa Yellows

Hansa yellows are made by coupling acetoacetarylides with diazotized aniline derivatives. The resulting dyes are particularly resistant to the action of sunlight and alkalies; qualities which make them desirable for formulating coatings to be used in exposed places. Like benzidine yellows, Hansas can

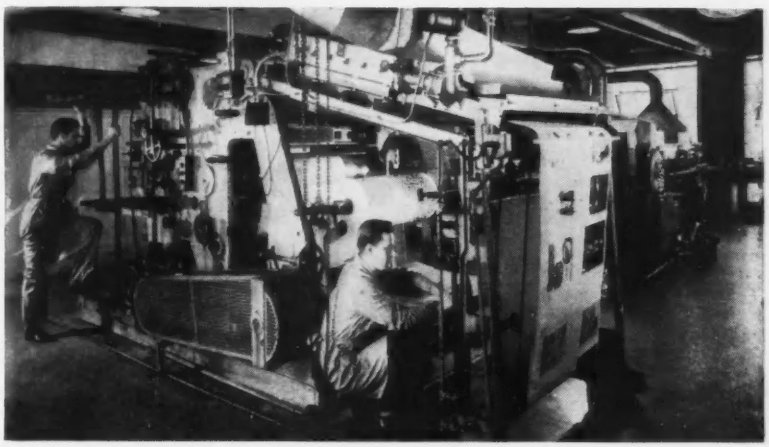
(*Continued on next page*)

Quick Test for Moisture Content of Dried Fish

In the usual method of testing dried fish for moisture, the fish are dried in a vacuum oven at 70 C. A new method, developed in Cape Town, S. A., is faster, and gives results to within 0.5 per cent of those secured by the usual method. The fish are extracted with boiling alcohol for 15 minutes, followed by determination of the critical solution temperature, with a paraffin-white oil mixture.

Analyzes Detergent Mixtures

Mixtures of soap and synthetic detergents may be analyzed by a new method which is said to give accurate results. The alcohol-soluble portion is extracted with ethanol, and the alcohol-insoluble salts are reprecipitated. Soap, fatty matter and alcohol-soluble chlorides are determined directly. Synthetic detergent is the difference between the total alcohol-soluble matter and the sum of soap, fatty matter and alcohol-soluble chlorides.



In the manufacture of colors for inks, Hansa yellows and the newer benzidine dyes have proven to be more practical, and just as economical as the prewar chrome yellows.

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June ★ **U.S.I. CHEMICAL NEWS** ★ 1945

Arylide Yellows

(Continued from preceding page)

be produced with widely varying characteristics by varying the intermediates.

Of the many factors that influence the quality and uniformity of Hansa and benzidine yellows, perhaps the most important is the purity of the acetoacetarylide intermediates. The exacting production methods employed by U.S.I. reduce impurities to a negligible minimum. Just as soon as there is an easing in the huge present demand for metallic sodium, U.S.I. will resume production of:

acetoacetanilide
acetoacet-ortho-chloroanilide
acetoacet-para-chloroanilide
acetoacet-ortho-toluidide
acetoacet-ortho-anisidide

In addition, U.S.I. has developed the following new compounds:

acetoacet-para-anisidide
acetoacet-para-phenetidide
acetoacetyl-alpha-naphthylamine
NN'-diacetoacetbenzidide
acetoacet-cresidide
acetoacet-dianisidide
diacetoacetyl-meta-toluylenediamine
ortho-phenylacetoacetanilide
acetoacet-para-nitroanilide

Samples of a majority of these intermediates are available for laboratory experimentation.

Ethanol, Acetone and Ether Aid Hormone Preparation

Prolactin, a lactogenic hormone extracted from the anterior lobe of the pituitary, is being used in treatment of cases of delayed or insufficient lactation.

This new biological is prepared by stirring an acetone-dried powder extract of animal anterior pituitaries with ethanol to which concentrated hydrochloric acid has been added. After centrifuging, the supernatant liquid is decanted and precipitated with 1-molar sodium hydroxide to provide a pH value between 7 and 9.

The last step is to settle the precipitate under refrigeration, separate it by filtering or centrifuging, and drying it with ether. Its assay is 10-12 Riddle units per milligram.

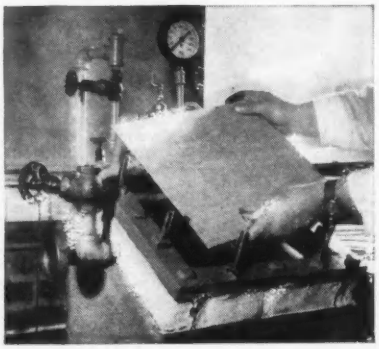
Ethanol Used 5 Times To Produce Galacturonic Acid

A purer α-d-galacturonic acid, for use in pharmaceuticals, is claimed for his newly patented process by a Pennsylvania inventor. Starting with a pectin and heated water mixture to which an enzyme system has been added, the solution is allowed to cool to 40 C. Following addition of toluene, the solution is kept at room temperature until the iodine number becomes constant, when it is concentrated under reduced pressure.

After warming to 60 C., ethanol is mixed with the concentrated solution, the insoluble material is permitted to settle, and the remaining sludge is washed by decanting twice with ethanol. Then the decanted wash liquor is chilled, and more insoluble gummy material is permitted to settle.

Following further purification with activated charcoal, the filtrate is concentrated, seeded and chilled. The mass of crystals which forms is broken up, triturated with ethanol, filtered, washed with ethanol and then dried. The resulting product is said to be a very pure α-d-galacturonic acid.

AMERICA'S ONLY "TIN MINES" are in American kitchens. Turn in your empty tin cans regularly.



To study plywood adhesives, U.S.I.'s resin laboratories have designed and built this miniature glue press which duplicates conditions encountered in large presses. The specimen to be laminated is placed between a rubber sheet and a steel plate. Air pressure expands the rubber sheet, firmly and uniformly forcing the plywood against the steel plate. Steam generated within the chamber supplies the heat.

TECHNICAL DEVELOPMENTS

Further information on these items may be obtained by writing to U.S.I.

A coating for magnesium promises to extend the use of this light metal in industry. One coat is said to provide a decorative finish for interior use, while two or more coats give years of outdoor protection. There is also a clear finish for polished magnesium surfaces. **(No. 942)**

USI

A new enamel, intended for painting surfaces exposed to very low temperatures is claimed to be acid-fume resistant, odorless and non-yellowing. Supplied in white, it may be tinted with oil colors. A companion primer is offered for application on asphalt and mastic finishes. **(No. 943)**

USI

A soybean drying oil is claimed to be practically the equal of linseed oil for use in paints, varnishes and synthetic resin products. It comes in two viscosities, F-G and D-E. **(No. 944)**

USI

Maintaining oil viscosity at a given point, and independent of temperature change, is the announced function of a new additive for lubricating and hydraulic oils. **(No. 945)**

USI

A light-colored plasticizer, developed specifically for use in light-colored GR-S stocks and black stocks which will not stain light finishes, is announced. The new compound is said not to affect the rate of cure appreciably. **(No. 946)**

USI

Alternates for citrus oils, to flavor candy and other food products, are announced. Standard flavors are orange, lemon and lime. **(No. 947)**

USI

A new line of metallic phosphates is announced as ready for post-war production. One is said to impart ultra-violet radiation properties to glass, and to give it superior optical, electrical and mechanical qualities. The second, a white pigment, and a third, a source of enriching iron for foodstuffs, are mentioned. **(No. 948)**

USI

New aliphatic derivatives, made up of the even-numbered normal hydrocarbons from C_8 to C_{18}, and their corresponding olefins, alcohols, ethers, mercaptans, etc., are suggested for use in cosmetics, plasticizers, corrosion inhibitors, oil additives, insecticides and stabilizers. **(No. 949)**

USI

A new hand cream to remove paint, as well as lacquer, enamel and resins, is designed to be worked into the skin like soap, then rinsed off with water. **(No. 950)**

USI

A colloidal aluminum-silicate gel, with a particle size ranging from 0.1 micron to 1 micron, is offered with the statement that it may be moderately acidified or alkalized without physical or chemical reactions. It is recommended for use in rubber, adhesives, paints and similar products. **(No. 951)**

USI

To protect frozen foods, a new thermosetting coating, applied by dipping, is described as forming a homogenous protective film over the entire product. **(No. 952)**

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ALCOHOLS
Amyl Alcohols
Butanols: *Normal Butyl Alcohol, Refined
Ethanol (Ethyl Alcohol)
Specially Denatured—all regular and anhydrous formulas
Completely Denatured—all regular and anhydrous formulas
Pure—190 proof, C.P. 96%, Absolute
*Super Pyro Anti-freeze
*Solox Proprietary Solvent

***ANSOLS**
Ansol M
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ACETIC ESTERS
Amyl Acetate
Butyl Acetate
Ethyl Acetate

OXALIC ESTERS
Dibutyl Oxalate
Diethyl Oxalate

PHTHALIC ESTERS
Diamyl Phthalate
Dibutyl Phthalate
Diethyl Phthalate

OTHER ESTERS
*Diatol
Diethyl Carbonate
Ethyl Chloroformate
Ethyl Formate

INTERMEDIATES
Acetoacetanilide
Acetoacet-ortho-anisidide
Acetoacet-ortho-chloranilide
Acetoacet-ortho-toluidide
Acetoacet-para-chloranilide
Ethyl Acetoacetate
Ethyl Benzoylacetate
Ethyl Sodium Oxalacetate

ETHERS
Ethyl Ether
Ethyl Ether Absolute—A.C.S.

FEED CONCENTRATES
*Curbay B.G.
*Curbay Special Liquid
*Vacatone 40

ACETONE
Chemically Pure

RESINS
S&W Ester Gums—all types
S&W Congo Gums—raw, fused & esterified
S&W *Aroplaz—alkyds and allied materials
S&W *Arotene—pure phenolics
S&W *Arochem—modified types
S&W Natural Resins—all standard grades

OTHER PRODUCTS
Collodions
Ethylene Glycol
Nitrocellulose Solutions
Ethylene
*Indalone
Urethan

*Registered Trade Mark

News and events

Dodge & Olcott Co. and U.S.I. Merged

Management and Personnel Continue as in Past . . . Name Changed to Dodge & Olcott Inc. . . . Why Companies Merged

The merger of Dodge & Olcott Co. with U. S. Industrial Chemicals, Inc., which became effective June 1 brought together one of the largest and most enterprising chemical concerns with the oldest essential oil company in the industry. In fact Dodge & Olcott Co. and its predecessors have weathered 147 years, passing the tests of time, depressions, deaths and wars so that it is now one of the largest essential oil houses in the country and one of the broadest in the scope of its activities.

FOUNDING THE COMPANY

Founded in 1798, at 128 Pearl St., New York City, by Robert Bach, the concern became Robert Bach & Co. in 1801, and Bach & Bradish in 1821. Richard J. Dodge became a partner in 1840, when the name was changed to Dodge, Cumming & Co., Mr. Cumming being a son-in-law of Robert Bach. In 1850 the name was again changed to Dodge & Colvill.

In 1856, George M. Olcott became a member of the firm. He was a son of Charles M. Olcott, a founder of Olcott & McKesson, later McKesson & Robbins. Subsequently, Francis E. Dodge, son of Richard J. Dodge, entered the house and was admitted to partnership in 1870, thereby increasing the Dodge interest in the business. He was responsible for expanding the firm's buying activities in such areas as the East Indies, China, the Orient, and South America.

In 1861, the house became Dodge & Olcott. The death of Richard J. Dodge in 1891 left Mr. Olcott senior partner, the other two partners being F. E. Dodge and F. H. Sloan, the latter an employee of many years who was admitted to partnership in 1886.

Francis T. Dodge

January 1, 1905, the business was incorporated as Dodge & Olcott Co. with George M. Olcott as president and F. E. Dodge and F. H. Sloan as vice-presidents. After the death of Mr. Olcott in 1917, F. H. Sloan was elected president and F. E. Dodge, on account of his advanced years, was elected honorary president and Christian Beilstein, vice-president.

On the retirement of F. H. Sloan in 1926, Francis T. Dodge was elected president, and still acts in that capacity. He is the son of F. E. Dodge and grandson of Richard J. Dodge, the original member of that name in the business.

An unusual instance of family business successions lies in the fact that F. E. Dodge's first wife was a granddaughter of Robert Bach—thus the tie of relationship reached back to the founder of the business.

In his youth, Francis T. Dodge spent many years in London as the company's London representative, and in that unsurpassed mart, dealing in world-wide merchandise, acquired an intimate and valuable knowledge of foreign trade and affairs.

THE FIRST PLANT

The organization from its inception imported essential oils and crude drugs, but about 1872 it started to distill some of the articles it had been importing. The first distillation of caraway, sandalwood, nutmeg, clove, cubeb, bay, from raw materials imported direct from the countries of production was carried on by means of a locomotive boiler system at 88 William St., New York, adjoining the office of those days. In 1880, as the business outgrew the distillation carried on in William St., a site was purchased for the erection of a factory in Jersey City. This factory burned and manufacturing was moved to Brooklyn. Because of the building of the Manhattan bridge, the factory was forced to move again—this time to Bayonne, N. J., where all distilla-

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tion, rectification, research and experimental work continues, but now on a very large scale, by a staff of expert chemists, the Chief Chemist having been Dr. F. D. Dodge, until his death in March, 1942.

Under the able direction of F. T. Dodge for the past nineteen years, the company's activities have been extended both at home and abroad, and, not the least of his accomplishments, he has built up a most efficient organization.

For the past 35 years the company has been a large distributor of natural and artificial flavors to the food and confectionery industries, and for the last 50 years has been regarded as one of the largest importers and most important dealers in all types of vanilla beans. The company's exports of American essential oils are important in volume. It caters to the soft drink, confectionery, flavoring extract, chewing gum, soap making, perfumery, cosmetic, wholesale drug, insecticide and several other industries.

Prior to 1937, the company purchased brown camphor oils from the then possessions of the Japanese, from which artificial sassafras and safrol were made. The Japanese, however, decided to do all of their own work on camphor oil and when they found a way to do it, cut off the supply of brown camphor oil. With the loss of the camphor business, the company looked around for something to take its place, and found it in the insecticide business. Consequently a few insecticides were manufactured, the company devoting its attention chiefly to the rotenone bearing roots, although it also did some work with pyrethrum.

IMPROVED PRODUCTION

Gradually the company improved its technique in the manufacture of pyrethrum, using a modification of the processes employed for years in the manufacture of oleo resins, of which it had become one of the largest producers in the country.

Around 1939 or 1940, a new method of spraying pyrethrum extract insecticides was developed in which a highly concentrated extract of pyrethrum was dissolved in a material which was a liquid under pressure, but a gas when the pressure was released. Various liquids were used at first, but finally it was found that a solution of pyrethrum in freon gave startling results; but for some time it remained an academic proposition because practically all commercial pyrethrum extracts on the market contained so many impurities that, when sprayed into the air in a closed room or into an airplane full of people, the spray caused considerable discomfort, such as sneezing, coughing and sniffling. However, Dodge & Olcott Co. had by now developed a new technique of manufacturing pyrethrum extract, which produced a material of such purity that it was possible to use it when dissolved in freon; and to dispense it from what were called "aerosol insect bombs."

For a year or more after 1942 Dodge & Olcott Co., carried the entire burden of furnishing the Armed Forces with pyrethrum extract and was thus instrumental in saving the lives of thousands of our fighting men in the tropics from malaria and other insect-borne diseases. Subsequently, others discovered a way to produce a more purified product and were thus able to share with Dodge &

THE BENDER CORP.

Manufacturing Chemists Since 1922

Toilet Water • Cologne • Perfume

BULK AND PRIVATE LABEL

•

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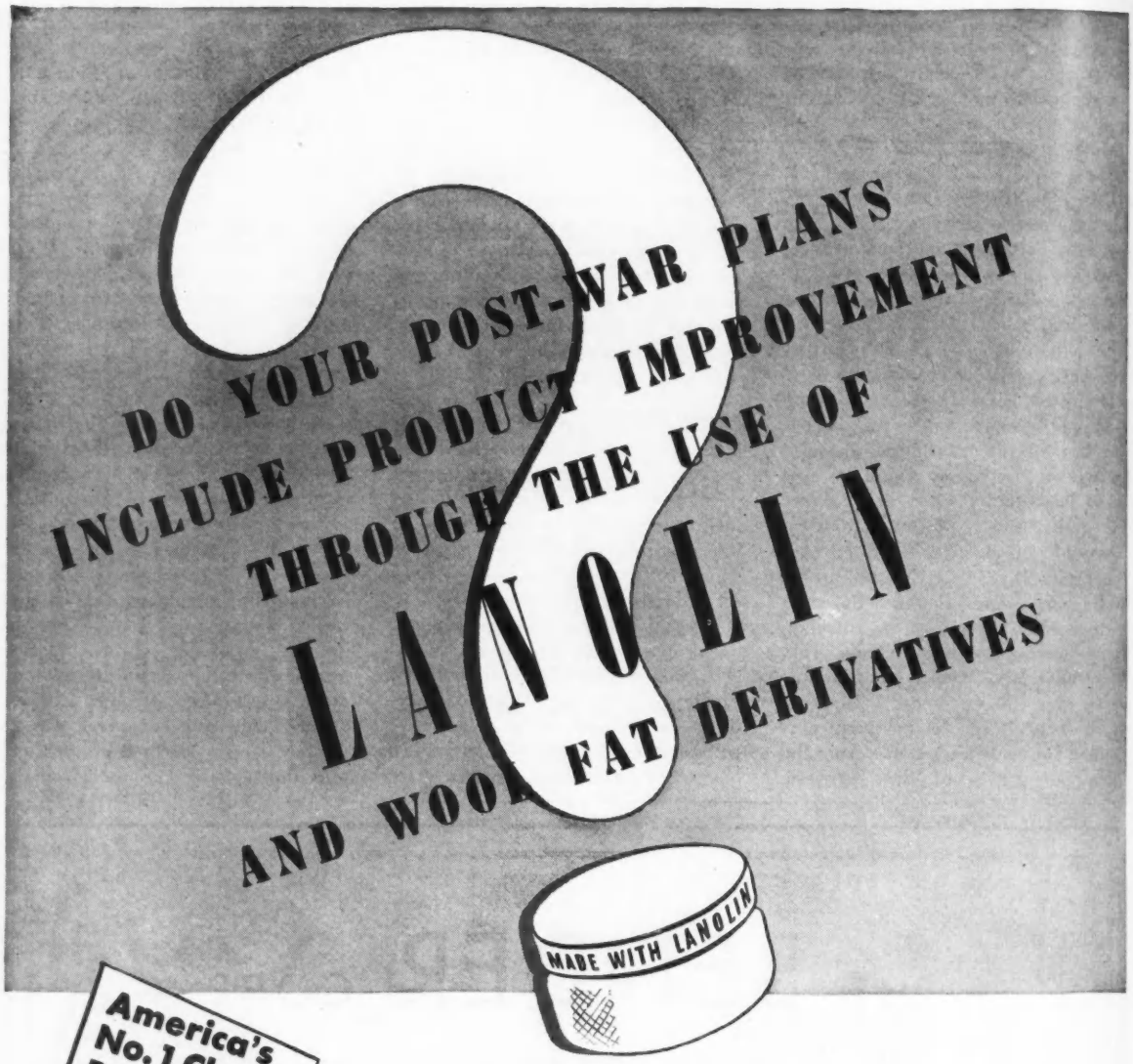

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Olcott Co., the burden of supplying the material.

The development of the foregoing business is credited by Mr. Dodge largely to the efforts of Charles A. Myers, for many years vice-president of the company in general charge of its manufacturing plant and to Dr. Lee Allen Parker, chief chemist. Mr. Myers, a veteran of 38 years with the company, worked very closely with Dr. F. D. Dodge until the time of the latter's death. Russell B. Stoddard as in the past will continue in charge of the department handling insecticide materials.

COMPANY OFFICIALS

Another vice-president, Valentine H. Fischer has been with the company 20 years and functions in the highly important field of importing and purchasing of essential oils. His experience and service with the company are highly valued. He also has charge of company personnel.

Charles O. Homan, for many years a leading salesman with the company, was made sales manager in 1938 in general charge of all company sales. With the present change of ownership, Mr. Homan has been made a vice-president of the company. Other officers are **R. W. Bush**, secretary; J. A. Corson and J. W. Booth, assistant secretaries; F. H. Kirn, treasurer and L. F. Schwartz, assistant treasurer. Mr. Bush has served "D & O" for 57 years. Mr. Booth is a grandson of George M. Olcott.

WHY COMPANIES MERGED

In announcing the change of ownership, Mr. Dodge stated that the shares in "D & O" have been closely held, chiefly by the Dodge and the Olcott families, both of which groups have for some time past been desirous of converting their substantial holdings into a more liquid form of investment. The sale to U. S. Industrial Chemicals, Inc., has accomplished this purpose. He also stated that the name of the new organization will be Dodge & Olcott Inc., substantially the same as it has been since 1861; and further, that the same officers who have been at the helm for many years past will continue to direct the policies and activities of the company. Not a single employee will lose his job as a result of the merger; the company's banking connections will remain unaltered; and the branch offices will be unchanged. He also pointed out the added advantage to the company in this merger with U. S. Industrial Chemicals, Inc., because of the latter's very extensive research facilities.

U. S. Industrial Chemicals, Inc., under the skilled leadership of Glenn L. Haskell, president, has won a leading position in the solvents and chemical industries. The main office is in New York, N. Y., and branches are maintained in all principal cities.

Sofskin Co. to Manufacture Cosmetics

Sofskin Co., Findlay, Ohio, has been incorporated by E. L. Martin, Mary Glessner and Harry Glessner, to manufacture cosmetics.

Imported Cosmetics Mark-up Based on Year 1942

A mark-up of 61 per cent on imported perfumes and cosmetics was reported in this section last month. Mark-ups may be increased one-third if the cost to retailers is not above that of March, 1942, retail cost.

BRIDGEPORT...

For the past two years our facilities have been devoted almost exclusively to the production of war materials. We have been fortunate, in that we have been able to handle this work on the same equipment used for our regular peace time products, and, consequently, when material again becomes available for lipstick containers, vanity cases and other metal cosmetic items we will be prepared to start producing our regular line immediately. If you too are planning your post war program, we will be glad to assist you.

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Perfumers and Executives Celebrate Double Firmenich Anniversary

In celebration of the fiftieth anniversary of the founding of Chuit and Naef in 1895, the parent of Firmenich & Cie of Geneva, Switzerland, and the ninth anniversary of Firmenich & Co. of New York, leading perfumers and executives in the cosmetic and allied industries attended a reception given by the company at the Gramercy Park Hotel, New York, N. Y., on the afternoon of May 15. About 200 guests attended the reception. They were greeted by Rupert C. Watson, general manager, Mrs. Watson, Dr. A. T. Frascati, chief chemist, and members of the staff of Firmenich & Co.

The original concern, parent of the company of which Firmenich & Co. is a branch, was established by the late Dr. Jean Phillipe Chuit and Martin Naef, May 15, 1895, as Chuit & Naef. Later it was successively known as Chuit, Naef & Cie, M. Naef & Cie and finally Firmenich & Cie. In 1905 Fred Firmenich, a brother-in-law of Dr. Chuit, who died incidentally in 1939, joined the organization. He is still active head of the business, and his many friends will be delighted to know that he is well. Subsequently, his brother Hugo,

Fred Firmenich

Rupert C. Watson

Roger Firmenich

Dr. Leopold Ruzicka

a gifted engineer, came into the company as plant manager and later his sons, Andre Firmenich and Dr. Roger Firmenich, were admitted as partners. Dr. Firmenich got his doctor's degree from the University of Paris and was also graduated from the Polytechnic School of Zurich. He also did research work at the Pasteur Institute in Paris and at Columbia University. Andre Firmenich gives his attention primarily to administration and sales.

Associated with the company is the distinguished Prof. Leopold Ruzicka of the University of Zurich. His brilliant research on the active principles of natural musks and civet resulted in their manufacture by the company. Dr. Ruzicka was honored by Harvard University during the tercentenary with the honorary degree of Doctor of Science, and later for his contribution to our industry he was awarded the Nobel prize in chemistry.

Firmenich & Cie operates its own branches in the principal cities of the world such as London, Paris, Barcelona, Berlin and Buenos Aires. In 1936, after being represented in this country for years by Ungerer & Co., it organized an American

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branch in New York, Firmenich & Co., Inc., with Andre Firmenich, president; Rupert C. Watson, vice-president, treasurer and general manager; and L. D. Cruttenden, secretary. January 1, 1942, the American company was reorganized as a partnership consisting of the members of the Firmenich family and Rupert C. Watson as sole resident partner. Under the able and energetic management of Mr. Watson, the company has made conspicuous progress, and like the parent company abroad, with the coming of peace, it promises to establish new records in serving the toilet goods industry with its many interesting and useful products.

Anti-Discrimination Law Explained Cheered and Hooted in New York

Irving M. Ives, majority leader of the New York State assembly and co-sponsor of the Ives-Quinn anti-discrimination bill which becomes effective in New York State July 1, explained the purposes and principal features of the bill to a large audience of executives in the cosmetic and allied trades at the Waldorf-Astoria, New York, N. Y., May 17.

The new law prohibits discrimination in employment because of color, creed, race or national origin for employers of six or more. Procedure is to be by secret conference. Cease and desist orders will follow when necessary and a court review is authorized except that the facts found by the Commission to administer the law are conclusive when supported by the record. The penalties are those for a misdemeanor.

Written questions invited by the speaker were taken up at the conclusion of the address. Most were answered frankly; some brought applause; and some answers left the questioner in doubt. For example, one question was "We want to employ a colored porter. How can we advertise for one and still comply with the law?" Mr. Ives suggested putting an ad in the newspapers simply asking for a porter on the assumption that only colored men would answer it. Another inquiry asked whether the law, which does not affect employers of six or less, was not discriminating against employers of larger numbers and hence unconstitutional because a state is prohibited by the U. S. Constitution from denying to all citizens the equal protection of the laws. The answer was vague and unconvincing; but the answer which brought most "boos" came to the question: "An alien applies for a job and later a citizen applies; both have the same fitness for the job—who gets it?" The answer was "the alien!" This brought voluble dissatisfaction. (Mr. Ives was probably mistaken as there is nothing in the law which would restrict an employer from making citizenship a requirement for a position.)

Stearic Acid Order Amended

The War Food Administration has amended WFO No. 129 to require users of stearic acid for essential purposes to file certified orders with suppliers by the first of each month instead of the sixteenth. After that date, suppliers may fill non-certified orders.

The amendment also allows an inventory exemption of 200 pounds of stearic acid to protect small users and distributors.

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Stanton Laboratories Acquires New Factory Site in Philadelphia

Stanton Laboratories, Wyncote, Pa., announces that it has purchased a property in the Manayunk section of Philadelphia, Pa., consisting of two buildings extending over 157,000 sq. ft. One four-story building of 25,000 sq. ft. is being equipped for increased production of thioglycolic acid and its various salts. The building will be completely equipped by about July 1 and the company will have an interesting announcement later about new products it will be prepared to offer.

Cosmetic Credit Men to Hold Summer Party in Plandome June 22

Plans have been completed by the Drug, Cosmetic and Chemical Credit Men's Assn. for the annual summer party at the Plandome Golf Club, Plandome, N. Y., June 22. The party will assemble at the home of Nat Otte, secretary, in Great Neck and from there those who wish to play golf will go to the Plandome Golf Club for luncheon. Other entertainment will be provided for those who do not care to play golf. In the evening a cocktail party will precede the dinner at the golf club. After that members and guests will return to Mr. Otte's home for an evening of music and informal gayety.

Chicago Perfumers Open Golf Tournament

The Chicago Perfumery, Soap and Extract Association held the opening session of the season on golf on May 22, at the Elmhurst Country Club. Dinner was served later, followed by bridge, gin rummy, and other activities.

The schedule calls for four other tournaments to be held: June 19, at the Rolling Green Country Club; July 24, at Olympia Fields; Aug. 21, at the Medinah Country Club; and Sept. 12, at the Edgewood Valley Country Club.

Florasynth Laboratories Building New Warehouse

Florasynth Laboratories, Inc., New York, N. Y., is building a new warehouse at 4641 Hollywood Blvd., Los Angeles, Calif.

Marjorie Groff, Marcel Michelin, Fleur Fenton and Harold Hutchins at lunch.

New Members in George Lueders' Veteran's Assn.

During the past year, four more employees of George Lueders & Co., New York, N. Y., have joined the ranks of that company's Veteran's Association. The Association is made up of employees who have a record of twenty-five years with the company. The new members are: William Allstadt, John Clifford, Louis Weissenberger and Frank Drugan.

A luncheon was given to each at the Drug and Chemical Club, and a watch was presented in honor of the occasion. The employees also manifested their regard for these twenty-five year veterans in the form of tangible gifts.

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Juniper Berries and Orris Root Import Regulations

The Foreign Economic Administration is negotiating for substantial shipments of juniper berries and orris root from Italy.

Importers desiring a share of the products are asked to submit the following data to the General Commodities Division, U. S. Commercial Co., Washington, D. C.: Quantities purchased in the years 1936 to 1940, inclusive; entry date of shipments with entry number, if available; port of entry; and country of origin.

Brooks Reelected President of TGA

The tellers of the mail election of the Toilet Goods Assn., Inc., reported the result of their count on May 16. The following officers and members of the Executive Board were revealed as those chosen: President, Herman L. Brooks; vice-presidents, Paul Douglas, William Bristol, Jr., and H. Willats; treasurer, Paul Vallee; secretary, J. Keho; vice-chairman of the Scientific Section, Dr. M. W. Tapley; Executive Board (active members—terms expire in 1948), J. C. Ozier, Davis Factor, J. H. McShane, Northam Warren, Norman Dahl and George Wrisley; associate members (terms expire 1946), L. R. Root and A. L. van Ameringen.

The new Executive Board met May 18 and voted to retain the following staff: Executive Vice-president, S. L. Mayham; director of scientific research and standards, H. D. Goulden; assistant secretary, Henry Etsch; council, Hugo Mosck and associate council, Gail B. Selig.

Northam Warren Beats Manpower Shortage

Northam Warren Corp., Stanford, Conn., has solved, at least in part, its manpower shortage problem. This has been done through the employment of high-school girls as part time employees. The girls—about 60 of them, sixteen years and older—are an established part of plant routine.

The employment program has been carefully coordinated with school authorities to insure the maintenance of scholastic standing. It has not been apparent that the part time work has interfered with studies.

Products of Tomorrow Exposition

It has been reported that America's first "Products of Tomorrow Exposition" has been approved by Washington for an opening early in 1946 in Chicago, Ill. The Office of Defense Transportation is expected to shortly assign a date for the opening of this International Exposition that will be some time between Jan. 1 and March 1, 1946.

It is anticipated that the Chicago Coliseum, The North Hall Exhibition Building, The Armory and the Administration Building are part of a group to be used.

Exhibitors will have few restrictions on the design of displays, but rather will be encouraged to use originality. Products will comprise two main divisions, consumer and industrial. Plans are complete to use a million square feet of space.

The "Products of Tomorrow Exposition" will be an annual event to provide a springboard for the introduction of new products. The Exposition will be kept open as long as attendance warrants. Floor space is now being booked by exhibitors.

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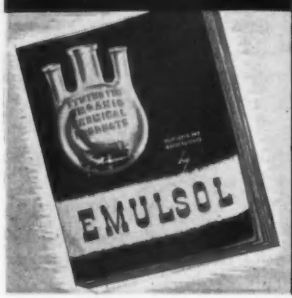

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David Bennett First to Go to France Since War's End Forecasts Outlook

David A. Bennett, the enterprising president of Albert Verley & Co., Chicago, Ill., has the distinction of being the first American essential oil man to go to France since the end of the war in Europe. Mr. Bennett and Otto Baptist, general manager of the export division of Albert Verley & Co., flew to France, May 18, and returned to this country by airplane June 6.

On arrival they went to Paris where they remained for three weeks to obtain accurate, first hand insight on the floral products situation and the outlook for the supply of floral products and other needed raw materials produced in France and other parts of Europe and North Africa.

Contacts which were interrupted during the war have been reestablished with the essential oil house of V. Mane Fils of Bar-sur-Loup, France, for whom Albert Verley & Co. are American representatives. Due to transportation difficulties and also to the fact that Eugene Mane went to Paris to welcome Mr. Bennett, Grasse was not visited. In addition to investigating the raw material situation Mr. Bennett held numerous conferences with principals in the French perfumery industry and leaders in the field of organic chemistry.

While reluctant to comment, Mr. Bennett felt that the outlook for adequate supplies of natural floral products is not very encouraging because there are not enough to meet either current demands or those in the immediate future. The needs of the French perfumers will be given first consideration in the allotment of available raw materials and after that the other countries will be entitled to and will receive their share of what remains. The United States, Mr. Bennett declared, should do its utmost in every way to help France get back on its feet.

A notable event signalizing the resumption of business between the house of V. Mane Fils and Albert Verley & Co. was a dinner at the Claridge Hotel, Paris, May 26, attended by Eugene Mane of V. Mane Fils, David A. Bennett and Otto Baptist of Albert Verley & Co., Prof. L. Palfray of the Institut Catholique, Paris, who is an internationally known authority on organic synthesis, and Dr. Sebastien Sabetay of Neuilly sur Seine, France, the author of several books on organic chemistry.

Left to right: Eugene Mane, David A. Bennett, Prof. L. Palfray, Otto Baptist and Dr. Sebastian Sabetay at dinner in Claridge Hotel, Paris, May 26

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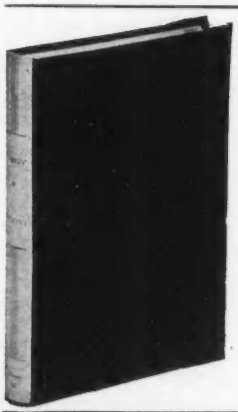

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MARKET REPORT

Ceylon Citronella Advances in Price

ARRIVAL of a good quantity of Egyptian henna leaves, the first to reach this market in almost two years, rumors of another large shipment of oil bergamot from Italy, and negotiations by the Foreign Economic Administration for substantial quantities of orris root to be shipped to the United States, were but a few of the many developments that tended to lift hopes regarding a gradual resumption of European trade in badly needed raw materials.

Importers desiring a share of orris root from Italy have been requested to submit detailed information including the quantities of orris purchased in the years 1936-1940; entry date of shipments with entry numbers, if available; port of entry and the country of origin. Such information is to be forwarded to the U. S. Commercial Corporation in Washington.

EGYPTIAN HENNA STOCK RENEWED

The appearance of Egyptian henna failed to have any influence upon the spot position. Stocks here of Egyptian henna had long since been exhausted and the goods found ready takers as quickly as they were placed on the dock. While the total quantity could not be learned one importer stated that he obtained over twenty tons, and it is understood that additional lots were consigned to other local houses.

REDUCED DEMAND FOR GLYCERINE

While there was nothing alarming in the glycerine situation, over the past month nevertheless, major suppliers indicated some tightening in the supply position. There was no shortage of goods but with mounting military demands for rocket powder, supplies were not as free as they were two months ago. Shortage of phthalic anhydride and rosin is reflected in a generally reduced demand for glycerine from the protective coating trade, but withdrawals for the account of the tobacco, pharmaceutical, and cosmetic trades have been continuing at a satisfactory rate. For a time, it was believed considerable quantities would be required for demolition work in Europe, but because of the increasing knowledge acquired with regard to explosives during the war period, it now appears certain portions of military goods on hand in Europe may be used for this purpose. There does not appear to be any immediate prospect of additional Lend-Lease orders coming into the market. While further details are lacking it is generally understood that negotiations are underway for the importation of a sizable quantity of crude glycerine from the Argentine.

Prospects with regard to replacements of certain soap oils seemed brighter as private exporters were given the go-ahead signal for resumption of trade with the Philippines. FEA announced late last month that licenses would be granted for commercial export shipments to the Islands while it was understood that the War Shipping Administration was making a monthly allocation of 30,00 tons of shipping to the Commonwealth Government.

MENTHOL PRICES LOWER

There was a slight spurt noted in the inquiry for menthol toward the close of the period under review. The inquiry failed to develop into actual business, however, and spot prices turned lower. New production is arriving from Brazil but since exporters have had difficulty in selling future shipments for the account of United States buyers, there has been considerable talk of reducing the minimum export floor price in Brazil from $19.50 per kilo to $14.

AROMATIC CHEMICALS IN DEMAND

Demand for aromatic chemicals is continuing to run well ahead of the supply. Military requirements of various basic commodities leave only token quantities of them for aromatic chemical manufacture and there still remains the problem of obtaining sufficient labor to carry on operations. Some finished aromatics are feeling the result of direct allocations especially benzyl acetate and benzyl chloride which were placed under complete control June 1.

Among the essential oils, Ceylon citronella was featured by a rather sharp advance in spot prices. While a reasonable tonnage was received here, news from the primary center regarding intended purchases for the account of Great Britain served to have a strengthening influence upon the overall position. All varieties of orange oil were firm and active. Brazilian orange was higher for shipment. Advices from Brazil stated that Great Britain is paying fancy prices for fresh fruit thus leaving little material for oil pressing. Shipping prices on new crop Brazilian oil rose from $2.10 to $3.10 per kilo. Old crop was likewise higher, moving up to $2.25 per kilo as against a previous quotation of $1.80.

KARAYA SUPPLY ARRIVES

Among the gums, several lots of karaya arrived here late last month. Because of the tight supply position on spot, the new lots moved directly into consuming channels. Fluctuations in gum arabic were confined within narrow limits, but closing prices were somewhat above those which were in force at the opening of the period.

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Anise, U. S. P.	4.00	Nom'l
Imitation	1.75@	2.10
Aspic (spike) Span.	3.00@	3.75
Avocado	1.05@	1.25
Bay	1.50@	1.75
Bergamot	12.00	Nom'l
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Birchtar, rectified	4.25	Nom'l
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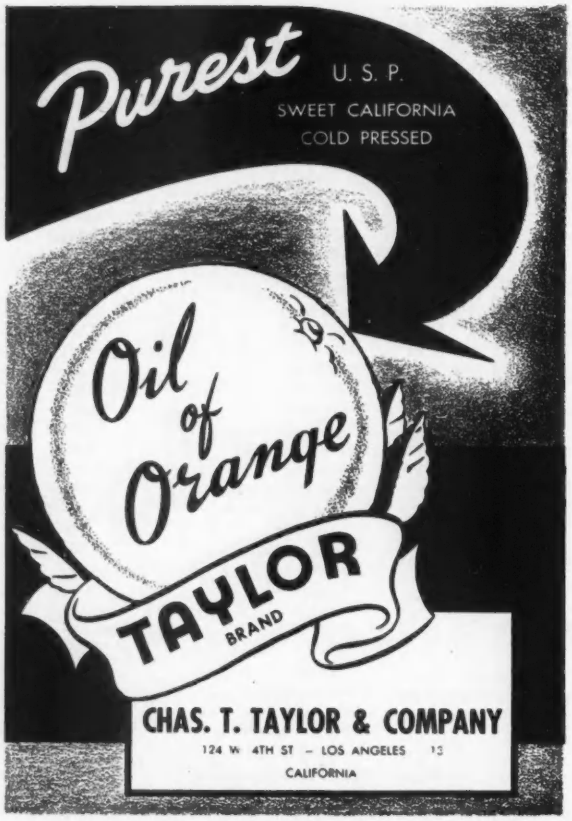

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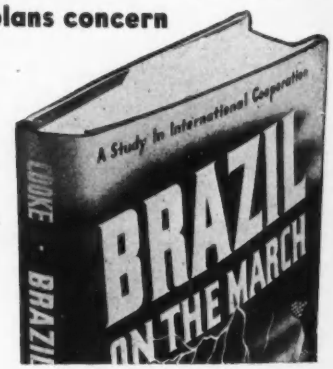

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Yellow, refined	.53½	Nom'l
Bismuth, subnitrate	1.20@	1.22
Borax, crystals, carlot ton	55.50@	58.00
Boric Acid, U. S. P., cwt.	6.95@	7.55
Calamine	.18@	.20
Calcium, phosphate	.08@	.08¾
Phosphate, tri-basic	.09@	.10
Camphor, domestic	.69@	.84
Castoreum	13.00@	17.00
Cetyl Alcohol	1.75@	1.80
Chalk, precip.	.03½@	.06½
Cherry Laurel Water, jug, gal.	3.60@	4.00
Citric Acid	.21	Nom'l
Civet, ounce	18.00@	25.00
Clay, colloidal	.07@	.15
Cocoa, Butter, lump	.25½@	.27
Cyclohexanol (Hexalin)	.30@	.50
Fuller's Earth, ton	15.00@	33.00
Glycerin, C. P., drums	.15½@	.15¾
Gum Arabic, white	.42@	.45
Amber	.12@	.13
Powdered, U.S.P.	.18@	.21
Gum Benzoin, Siam	5.00	Nom'l
Sumatra	1.40	Nom'l
Gum Galbanum	1.80@	2.00
Gum Myrrh	.55	Nom'l
Henna, pwd.	.30@	.35
Kaolin	.05@	.07
Labdanum	3.25@	5.00
Lanolin, hydrous	.30@	.34
Anhydrous	.31@	.35
Magnesium, carbonate	.09@	.10¾
Stearate	.24@	.27
Musk, ounce	50.00	Nom'l
Olibanum, tears	.21@	.35
Siftings	.11½@	.13
Orange Flower Water, gal.	1.75@	2.25
Orris Root, African, pwd.	1.10@	1.15
Paraffin	.06@	.09
Peroxide	1.10@	1.75
Petrolatum, white	.06¼@	.08½
Quince Seed	1.65@	1.95
Rice Starch	.10	Nom'l
Rose Leaves, red	3.45@	4.00
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Rosin, M. per cwt.	7.15@	
Salicylic Acid	.35@	.40
Saponin	2.00@	2.50
Silicate, 40°, drums, works, 100 pounds	.80@	1.20
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Stearate Zinc	.29@	.30
Styrax	1.10@	1.20
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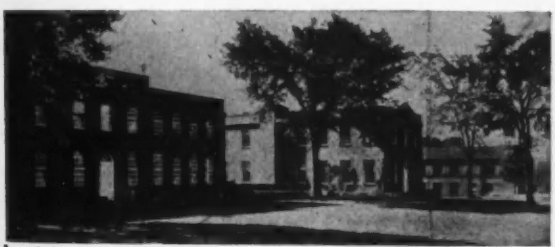

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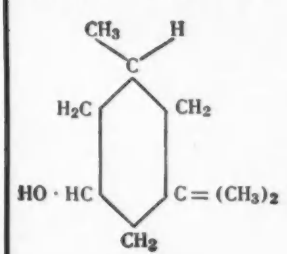

FIG. 1

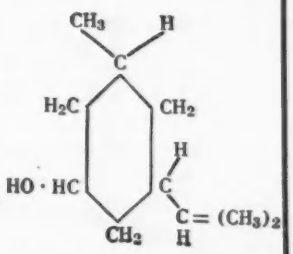

FIG. 2

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by MAISON G. DENAVARRE, Ph.C., B.S.

Technical Editor of the American Perfumer & Essential Oil Review, Expert Consultant, Engineer Board, U. S. Army; Special Lecturer in Cosmetics, Wayne University, College of Pharmacy; Consulting Chemist

Sixteenth Installment

The fifteenth installment was published in the preceding issue. Subsequent installments will appear in forthcoming issues.

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CHAPTER IV
(*continued*)

Physical and Chemical Testing
Gravimetric and Volumetric Methods

C-337—RESORCINOL

(U.S.P.)

Solubility—One gm of resorcinol dissolves in 1 cc of water and in about 1 cc of alcohol, at 25° C. It is freely soluble in glycerin and in ether, and is slightly soluble in chloroform.

Melting Point—Resorcinol melts between 109° and 111° C.

Identification—A: Dissolve 0.1 gm of resorcinol in 2 cc of sodium hydroxide T.S., add a drop of chloroform, and heat the mixture: an intense crimson color is produced, which changes to pale yellow on the addition of a slight excess of hydrochloric acid.

B: The addition of 3 drops of ferric chloride T.S. to 10 cc of an aqueous solution of resorcinol (1 in 200) produces a bluish violet color, which becomes brownish yellow on the addition of ammonia T.S.

Phenol—An aqueous solution of resorcinol (1 in 20) does not emit the odor of phenol when gently warmed.

Catechol—Add 0.5 cc of lead acetate T.S. to 10 cc of an aqueous solution of resorcinol (1 in 20) previously mixed with 2 drops of diluted acetic acid: no turbidity is produced.

Assay—Dissolve about 1.5 gm of resorcinol, previously dried over sulfuric acid for 18 hours and accurately weighed, in sufficient distilled water to make 500 cc of solution. Transfer 25 cc of this solution, representing one-twentieth of the weight of resorcinol taken, to an iodine flask, add 50 cc of tenth-normal bromine, dilute with 50 cc distilled water, add 5 cc of hydrochloric acid, and at once stopper the flask. Shake the flask, allow it to stand for 1 minute, remove the stopper just sufficiently to

introduce quickly 5 cc of potassium iodide T.S., being careful that no bromine vapor escapes, and at once stopper the flask. Shake the latter thoroughly, remove the stopper, and rinse it and the neck of the flask with 20 cc of distilled water, being sure that all of the rinsings run into the flask. Titrate the liberated iodine with tenth-normal sodium thiosulfate, using starch T.S. as the indicator. Each cc of tenth-normal bromine is equivalent to 0.001835 gm of $C_6H_6O_2$.

C-338—RESORCINOL, PASTE OF, STRONG

(N.F.)

Assay: Place 1 gm of the paste, accurately weighed, in a 250 cc flask, add 40 cc of hot water, stopper the flask tightly, and shake it vigorously. Decant the supernatant liquid onto a wetted filter and collect the filtrate in a 100 cc volumetric flask. Repeat the shaking-out process with two 15 cc portions of hot water, decanting after each extraction. Finally, rinse the contents of the flask onto the filter, and wash with sufficient hot water to make 100 cc of filtrate. Carefully preserve the filter and its contents for the determination of zinc oxide as directed below under "Assay for zinc oxide." Transfer 40 cc of the filtrate, representing 0.4 gm of the paste, to a 500 cc glass-stoppered iodine flask, add 50 cc of tenth-normal bromine, dilute with 50 cc of distilled water, add 5 cc of hydrochloric acid, and at once stopper the flask. Shake the mixture, allow it to stand for one minute, dilute it with 20 cc of distilled water, add 5 cc of potassium iodide T.S., allow it to stand for five minutes, and titrate the liberated iodine with tenth-normal sodium thiosulfate, using starch T.S. as the indicator. Each cc of tenth-normal bromine is equivalent to 0.001835 gm of $C_6H_4(OH)_2$.

Assay for zinc oxide: Dry and ignite the filter used in the preceding assay, together with its contents, until free of organic matter. Digest the residue, after ignition, with 25 cc of normal sulfuric acid until solution is complete. Then titrate the excess of sulfuric acid with normal sodium hydroxide, using methyl orange T.S. as the indicator. Each cc of normal sulfuric acid is equivalent to 0.04069 gm of ZnO.

C-339—RESORCINOL MONOACETATE

A viscous liquid, straw to deep caramel colored, boiling point 283° C with decomposition. It is freely soluble in 20 percent alcohol and in most organic solvents. It usually has a characteristic acetic odor. A 10 mm pressure completely distils between 150-153° C.

Euresol, a brand of resorcin monoacetate shows a free acidity equivalent to not more than 0.5 cc tenth *N* alkali when 10 cc is dissolved in 20 cc benzene and the mixture is shaken with 100 cc of distilled water, using methyl orange as indicator.

Responds to test for resorcin and acetate.

A 1:25 solution gives a reddish brown precipitate with Dragendorff's reagent. Bromine water gives a yellowish precipitate that redissolves at first. Dragendorff's reagent is made from 8 gm of bismuth subnitrate, 20 gm nitric acid, specific gravity 1.18; dissolve. Add this solution slowly to 22.7 gm of a saturated solution potassium iodide. Cool, decant from residue and dilute clear portion with water to 100 cc. There are other modifications of this solution for different tests.

C-340—RICINOLEATES

See Castor Oil, C-119 & 120

C-341—ROCHELLE SALT

See Potassium and Sodium Tartrate, C-316

C-342—ROSIN

(A.O.C.S.)

Wolff's Method, Modified. Dissolve 5 gm (±0.01 gm) of the sample in 100 to 200 cc of hot water, add a slight excess of dilute sulfuric acid, heat until the fatty acids collect in a clear layer, cool to room temperature, extract with a small portion of ethyl ether, draw off the water layer and wash the ether solution with water until free from mineral acid. Transfer to a 200 cc Erlenmeyer flask; evaporate off the ether and dry 1 hour at 105° C, cool and dissolve in 20 cc of absolute alcohol.

First Esterification: Add 10 cc of a solution of one volume of concentrated sulfuric acid (sp. gr. 1.84) and 4 volumes of absolute alcohol, and boil on the steam bath for 4 minutes under a reflux condenser. Remove from steam bath, add to the liquid about 5 times its volume of 7 to 10 percent sodium chloride solution, and extract with ethyl ether. Unite the ether solutions and wash with sodium chloride solution until the washings are neutral to methyl orange. Add 30 cc neutral alcohol, and titrate the rosin acids with standard sodium hydroxide solution, using phenolphthalein as indicator.

Second Esterification: Evaporate the alcohol and ether on the steam bath and dissolve the soap with water, split with dilute sulfuric acid and extract the rosin acid with a small portion ethyl ether. Dry the ether extract with anhydrous sodium sulphate, filter into a 200 cc Erlenmeyer flask and evaporate. Cool and dissolve in 20 cc of absolute alcohol. Then proceed as above under "First Esterification." Calculate titration to rosin or rosin soap, as desired (1 cc normal alkali = 0.346 gm rosin or 0.377 gm rosin soda soap). If the true fatty acid soap is desired, subtract the rosin soap from the total anhydrous soap.

C-343—ROSIN, McNICOLL METHOD

(A.O.C.S.)

Apparatus: The apparatus required consists of a glass flask connected, preferably by a ground-glass joint, to a reflux condenser.

(a) *Esterification Flask.* A 150 ml flask, of either the round-bottom or Erlenmeyer type, shall be used.

(b) *Reflux Condenser.* Any suitable water-cooled, glass, reflux condenser may be used.

Special Solutions Required:

(a) *Potassium Hydroxide.* (0.2*N*). Accurately standardize a 0.2 *N* solution of KOH in neutral, redistilled, 95 percent ethyl alcohol. (Due to volatility of alcohol, this solution should be restandardized frequently.)

(b) *Naphthalene-B-Sulfonic Acid Solution.* Dissolve 40 grams of Eastman grade, or equivalent, reagent in one liter of C.P., absolute, methyl alcohol.

(c) *Phenolphthalein Indicator.* Prepare a 0.5 percent solution in neutral, redistilled alcohol.

PROCEDURE

(a) *Preparation of Fatty and Rosin Acids.* For the preparation of the sample for this determination, follow the procedure described under "Preparation of Fatty Acids," C-157.

(b) *Esterification and Titration.* Weigh about 2.000 ± 0.001 grams of the fatty acids into the esterification flask. Add 25 ml of naphthalene-B-sulfonic acid solution. Add a few glass beads to ensure smooth boiling, attach to reflux condenser and boil for 30 minutes. Also run a blank test, using 25 ml of the reagent. At the end of the boiling period, cool the contents of the flask, add 0.5 ml of phenolphthalein indicator and titrate immediately with 0.2 *N* alcoholic potassium hydroxide.

(c) *Calculations.* — Calculate the results as follows (Note 1):

$$R = \frac{(S - B) \times N \times 0.346 \times 100}{W}$$

$$R_1 = R - 1.0$$

$$R_2 = \frac{R_1 \times F}{100}$$

$$R_s = \frac{R_1 \times 1.064 \times A}{100}$$

in which:

R = percentage of rosin in fatty acids.
R_1 = corrected percentage of rosin in fatty acids (Note 2).
R_2 = percentage of rosin on basis of original sample.
R_s = percentage of rosin soda soap on basis of original sample.
S = mililiters of KOH required to titrate sample.
B = mililiters of KOH required to titrate blank.
N = normality of KOH.
W = weight of sample.
F = percentage of total fatty acids in soap.
A = percentage of total anhydrous soap.

If true fatty acid soap is desired, subtract the rosin soap from total anhydrous soap.

Note 1.—In all cases where the rosin content is found to be less than 5 percent, the actual presence or absence of rosin should be checked qualitatively by the Liebermann-Storch test which is performed as follows:

One to 2 ml of the sample of fatty acids are shaken in a test tube with 5 to 10 ml C.P. acetic anhydride with gentle warming on a steam bath. After cooling, pour 1 or 2 ml into a white porcelain dish and allow a drop or two of sulfuric acid (Sp. Gr. 1.53) to run down the side of the vessel. If rosin is present, a fugitive violet coloration, changing to a brownish tinge, is immediately produced at the margin of contact of the reagents. The test should be checked with a sample of fatty acids to which a small amount of rosin has been added.

Sulfuric acid of 1.53 Sp. Gr. is prepared by diluting 34.7 ml of concentrated sulfuric acid (Sp. Gr. 1.84) with 35.7 ml of distilled water.

Note 2.—Co-operative studies have shown that the McNicoll Method gives results approximately one percent higher than the amount of rosin present. Consequently, the committee recommends deducting one percent from the percentage of rosin found in the fatty acids.

C-344—ROSIN

When contained in soaps or fatty mixtures, hydrolyze the product with mineral acid, extract with chloroform. Take about 3 cc of the extract in a test tube and add 5 cc of 66 percent sulfuric acid and shake well. Drop in acetic anhydride slowly. If any rosin is present, the chloroform layer will become violet in color. With further shaking, the color passes into the sulfuric acid solution below, coloring it a bluish-red to reddish-purple tint.

C-345—ROSIN

(*A.A.T.C.C.*)

Rosin or the alkali metal salts of rosin, if present, would be contained in the alcohol extract, and would be included with the sulfated fatty matter as determined previously. It would be difficult, if not impossible to separate quantitatively rosin from fatty matter in the small amounts, which would normally be present in fabrics. Rosin may be detected qualitatively as follows:

Extract a sample of the fabric with chloroform. Evaporate to a volume of about 3 ml. Transfer to a test tube, add 5 ml of 66 percent sulfuric acid and shake vigorously. Allow acetic anhydride to drop in. If rosin acids are present the upper chloroform layer will become violet. On shaking, the color passes into the sulfuric acid layer and colors it purple to carmine red.

C-346—ROSIN TEST

(*U.S.P.*)

In testing for rosin as an adulterant in resins, gum resins, and balsams, unless otherwise directed, place in a small mortar 1 gm of the substance, powdered or crushed if necessary, and add 10 cc of purified benzin. Triturate well for 1 or 2 minutes, filter into a test tube, and add to the filtrate 10 cc of a fresh aqueous solution of cupric acetate (1 in 200). Shake well and allow the liquids to separate: the benzin layer should not show a green color.

C-347—ROSIN, REACTION FOR—COHEN

(*Merck Index*)

Add a 1:5 (by volume) chloroform solution of chlorosulfonic acid to a solution of rosin in chloroform. A violet-red color develops. Ester gum and albertols give a red color. Tung and linseed oils do not interfere.

C-348—ROSIN OR ROSIN OIL, TEST FOR—STORCH-MORAWSKI

(*Merck Index*)

Dissolve a little of the substance to be tested with the aid of gentle heat in acetic anhydride, allow to cool, and then add a drop of concentrated H_2SO_4. If rosin or rosin oil is present, a transitory blue-violet or red color is produced, the mixture then becomes brown-yellow and fluorescent.

Michel dissolves the substance in 3 cc chloroform, adds 5 cc of 65 percent H_2SO_4, shakes and then cautiously adds acetic anhydride dropwise. The chloroform layer is colored violet if rosin or rosin oils are present.

Leppert-Majewska place a pinch of the powdered rosin or a drop of lacquer on a glass plate over a white paper, and wet with a few drops of a freshly prepared mixture of 15-20 volumes of acetic anhydride and 1 volume concentrated H_2SO_4. Rosin at first gives a dark violet color which later turns blue, while albertol first turns red, and shows no blue, later on. By this test it is possible to distinguish between lacquers based on rosin, rosin esters and copal.

C-349—ROSIN OR ABIETIC ACID, TEST FOR—LIEBERMANN

(*Merck Index*)

Dissolve the substance in 3 cc of chloroform, add 5 cc 65-67 percent H_2SO_4 and shake vigorously. Now allow acetic anhydride to drop in. If rosin acids are present the upper chloroform layer will become violet. On shaking, the color passes into the H_2SO_4 layer and colors it purple to carmine-red.

C-350—SACCHARIN

(*U.S.P.*)

Dissolve about 0.1 gm of saccharin in 5 cc of an aqueous solution of sodium hydroxide (1 in 20) evaporate the solution to dryness, and gently fuse the residue over a small flame until it no longer evolves ammonia. Allow the residue to cool, dissolve it in 20 cc of distilled water, neutralize the solution with diluted hydrochloric acid, and filter: the addition of a drop of ferric chloride T.S. to the filtrate produces a violet color.

Mix 20 mg of saccharin with 40 mg of resorcinol, add 10 drops of sulfuric acid, and heat the mixture over a small flame until it acquires a dark green color. Allow it to cool, add 10 cc of distilled water, and an excess of sodium hydroxide T.S.: a fluorescent green liquid results.

C-351—SACCHARIN, DETERMINATION OF THE SODIUM DERIVATIVE OF

(*M. J. Schulte. Pharm. Weekblad* **77**, *1281-2, 1940*
Chem. Zentr. 1941, I, 798)

The Hg derivative of saccharin is very slightly soluble; however, the Votocek method of titration cannot be used. The following method is given: 25 cc of a solution of the sample containing 2.38 gm per 100 cc is mixed with 40 cc of 0.1 *N* $Hg(NO_3)_2$ and filtered. When a 25-cc portion of the filtrate to which 10 cc of diluted HNO_3 and 1 cc of ferric ammonium sulfate solution, have been added is titrated with 0.1 *N* KSCN from 5.65 to 5.85 cc of the reagent should be required. This titration corresponds to a saccharin content of 99.3-99.5 percent (*Thru C. A.* ***36***, *7235, 1942.*)

C-352—SACCHARIN

(*A.O.A.C.*)

Preparation of Sample-Official

(a) Fruit juices and sirups. Transfer 100-200 gm of sample of 250 ml volumetric flask by means of a little H_2O and dilute to about 200 ml with H_2O. Add 5 ml of glacial acetic acid and mix. Add slight excess of 20 percent neutral Pb acetate solution, mix thoroughly, dilute to mark with H_2O, again mix thoroughly, and filter.

(b) Alcoholic liquids. Heat 100-200 ml of liquid on steam bath to remove alcohol (usually done by evaporating to one-half original volume). With heavy sirups, dilute liquid with equal volume of H_2O before beginning evaporation. After alcohol has been removed, transfer liquid to 250 ml volumetric flask and proceed as directed under (a).

(c) Solid or semi-solid preparations. Transfer 50-75 gm of sample to 250 ml volumetric flask by means of a little hot H_2O and add sufficient boiling H_2O to make volume about 200 ml. Allow mixture to stand for 2 hours, shaking occasionally. Add 5 ml of glacial acetic acid, mix thoroughly, add slight excess of 20 percent neutral Pb acetate solution, dilute to mark with cold H_2O, mix, allow to stand for 20 minutes, and filter.

QUALITATIVE TEST-OFFICIAL

(a) Acidify 50 ml of non-alcoholic liquid foods or the aqueous extract of 50 gm of a solid or semi-solid product, prepared as directed above, with HCl and extract three times with 25 ml portions of ether. Wash combined ether extracts once with 5 ml of H_2O, transfer to small beaker or evaporating dish, allow ether to evaporate spontaneously, and taste residue. (The presence of as little as 20 mg of saccharin per liter or kg of original sample can usually be detected by its sweet taste.) Confirm by heating with NaOH and detecting the salicylic acid formed thereby as directed under (b).

(b) Acidify with HCl 50 ml of a non-alcoholic liquid food, or equivalent quantity of aqueous extract, and extract with three portions of ether as directed under (a). Dissolve residue remaining after evaporation of the ether in a little hot H_2O and test small portion of the solution for salicylic acid as directed above. Dilute remainder of solution to about 10 ml and add 2 ml of H_2SO_4 (1 + 3). Heat to boiling and add slight excess of 5 percent $KMnO_4$ solution dropwise; partly cool solution, dissolve about 1 gm of NaOH in it, and filter mixture into an Ag dish (Ag crucible lids are well adapted to purpose). Evaporate to dryness and heat 20 minutes at 210-215°. Dissolve residue in H_2O, acidify with HCl, and test ether extract for salicylic acid as directed above. By this method all so-called "false saccharin" and any salicylic acid naturally present (also added salicylic acid when not present in too large a quantity) are destroyed, whereas 5 mg of saccharin per liter is detected with certainty.

C-353—SALICYLATE

(*U.S.P.*)

In moderately dilute solutions of salicylates, ferric chlorice T.S. produces a violet color. The addition of acids to moderately concentrated solutions of salicylates produces a white crystalline precipitate of salicylic acid.

C-354—SALICYLIC ACID

(*U.S.P.*)

Assay: Dissolve about 0.5 gm of salicylic acid, previously dried over sulfuric acid for five hours and accurately weighed in 25 cc of diluted alcohol, which previously has been neutralized with tenth-normal sodium hydroxide, using three drops of phenolphthalein T.S. as the indicator. Titrate this solution with tenth-normal sodium hydroxide to a pink color. Each cc of tenth-normal sodium hydroxide is equivalent to 0.01381 gm of $HC_7H_5O_3$.

C-355—SALICYLIC ACID, MICROCHEMICAL DETECTION AS SILVER SALICYLATE

(*H. Jurany, Mikrochemie,* **26,** *314, 1939*)

The microscopic appearance of the silver salt identified as little as 0.4 gamma of salicylic acid. It may be distinguished from the benzoate, sometimes appearing together in preserving foodstuffs.

C-356—SALICYLIC ACID IN HAIR LOTIONS

(*H. R. Bond, J. Assoc. Off. Agr. Chem.* **25,** *899, 1942*)

The following method for the determination of salicylic acid in hair lotions was adopted as tentative:

Acidify 25 ml of sample with 2 ml of 10 percent HCl in 250 ml beaker. Dealcoholize by heating at not more than 70°. Transfer to separator and dilute with H_2O to about 25 ml. (Since $CHCl_3$, is used as extracting solvent, transfer is best made by washing from beaker to separator with two or three portions of $CHCl_3$, totaling 25 ml, and repeating washing with H_2O in portions totaling 25 ml.

Extract with four 25 ml portions of $CHCl_3$ (includes the 25 ml used in transfer of sample to separator). Wash each $CHCl_3$ extract with 5 ml of H_2O and filter through a $CHCl_3$-saturated cotton pledget into a 150 ml beaker. Wash the 5 ml of H_2O with $CHCl_3$, filtering these washings into same beaker. Evaporate the $CHCl_3$ on steam bath to volume of 20-25 ml, allowing this quantity to evaporate spontaneously to a volume of 5 ml.

Transfer remaining 5 ml to separator, using enough $CHCl_3$ as rinsing agent to make volume in separator about 30 ml. Extract with three 5 ml portions of 5 percent aqueous $NaHCO_3$ solution and one 5 ml portion of H_2O. Wash extracts with 10 ml portion of $CHCl_3$ and discard the $CHCl_3$.

Filter combined aqueous bicarbonate solutions through filter paper into 100 ml volumetric flask, rinsing separators and washing filter with sufficient H_2O to make volume of filtrate to 100 ml mark. Agitate flask to obtain uniformity of solution.

Transfer aliquot of this solution, representing not less than 0.04 gm nor more than 0.05 gm of acetylsalicylic acid, to a 500 ml iodine flask; add 30 ml of the standard bromide-bromate solution and 5 ml of HCl and immediately insert stopper. Shake repeatedly 30 minutes and allow to stand 15 minutes. Remove stopper just sufficiently to introduce quickly 5 ml of the KI solution, taking care that no Br vapors escape, and immediately stopper flask. Shake thoroughly, remove stopper, and rinse it and neck of flask with a little H_2O so that washings flow into flask. Titrate with 0.1 *N* $Na_2S_2O_3$ solution, using starch indicator; 1 ml of 0.1 *N* bromide-bromate solution = 0.0023 gm of salicylic acid.

Note: Before adding the standard bromide-bromate solution carefully neutralize the aliquot in iodine flask to liberate CO_2 from bicarbonate present, then make alkaline with one drop of 10 per cent NaOH solution and continue as directed.

C-357—SAPONIFICATION VALUE

(*U.S.P.*)

The saponification value is the number of milligrams of potassium hydroxide required to neutralize the free acids and saponify the esters contained in 1 gm of a fat, fatty or volatile oil, wax, resin, balsam or similar substance. It is determined as follows: Place from 1.5 to 2 gm of the sample, accurately weighed, in a flask of from 200- to 250-cc capacity, and add to it exactly 25 cc of alcoholic half-normal potassium hydroxide. Insert into the neck of the flask, by means of a perforated stopper, an air condenser consisting of a glass tube from 70 to 80 cm in length and from 5 to 8 mm in diameter, and heat the flask on a water bath for 30 minutes, frequently rotating the contents. Then add 1 cc of phenolphthalein T.S. and titrate the excess of potassium hydroxide with half-normal hydrochloric acid. Make a blank test at the same time, using exactly the same amount of alcoholic half-normal potassium hydroxide. The difference between the number of cc of half-normal hydrochloric acid consumed in the actual test and in the blank test, multiplied by 28.05 and divided by the weight of sample taken gives the Saponification Value.

If the oil has been saturated with carbon dioxide for the purpose of preservation, it should be exposed in a shallow dish in a vacuum desiccator for 24 hours before the portions are weighed for this determination.

C-358—SAPONIFICATION NUMBER (KOETTSTORFER NUMBER)

(*A.O.C.S.*)

Preparation of Reagents. 0.5 *N* hydrochloric acid. Carefully standardized.

Alcoholic potassium hydroxide solution. Dissolve 40 gm of pure potassium hydroxide in 1 liter of 95 percent redistilled alcohol (by volume). The alcohol should be redistilled from potassium hydroxide over which it has been standing for some time, or with which it has been boiled for some time, using a reflux condenser. The solution must be clear and the potassium hydroxide free from carbonates.

Determination. Weigh accurately about 5 gm of the filtered sample into a 250- to 300-cc Erlenmeyer flask. Pipette 50 cc of the alcoholic potassium hydroxide solution into the flask, allowing the pipet to drain for a definite time. Connect the flask with an air condenser and boil until the fat is completely saponified (about 30 minutes). Cool and titrate with the 0.5 *N* hydrochloric acid, using phenolphthalein as an indicator. Calculate the Koettstorfer number (milligrams of potassium hydroxide required to saponify 1 gm of fat). Conduct two or three blank determinations, using the same pipet and draining for the same length of time as above.

C-359—SOLUBLE SAPONIFIABLES IN SKIN CREAM

(*H. D. Murray, J. Soc. Chem. Ind.,* **51,** *No. 50, 393-T, 394-T, 1932*)

These represent the soluble soaps. They are soluble in 10 percent alcohol containing ½ percent of potassium chloride and insoluble, or but slightly soluble, in light petroleum. They may be derived from either oils, fats, or waxes, and their direct determination does not provide much useful information, but the free fatty acids should be isolated and the iodine value thereof determined.

The filtered and extracted saponification solution is acidified with hydrochloric acid, brought to the boil, cooled, and extracted with two quantities of 100 cc of light petroleum. The extracts are washed, filtered, and

evaporated. The major portion of vegetable oils and fats is saponifiable. Spermaceti, however, gives only about 70 percent of soluble saponifiables by the above method, beeswax about 30 percent, and wool wax about 25 percent.

C-360—SOLUBLE SAPONIFIABLES IN SKIN CREAM, IODINE VALUE OF

(*H. D. Murray, J. Soc. Chem. Ind.*, **51**, *No. 50, 393-T, 394-T, 1932*)

This may be determined by Wijs' method and, as the value is usually low, a fairly large quantity of fat should be taken for the determination. Mean results of the iodine value on the soluble saponifiables obtained from different substances are as follows: peach-kernel oil 97.5, almond oil 94.5, cocoa butter 39.0, wool wax 17.5, beeswax 10.0; spermaceti 5.0

C-361—INSOLUBLE SAPONIFIABLES IN SKIN CREAM

(*H. D. Murray, J. Soc. Chem. Ind.*, **51**, *No. 50, 393-T, 394-T, 1932*)

The original aqueous saponification solution after extraction with light petroleum (whereby the unsaponifiable matter soluble in petroleum is removed) is diluted so as to reduce the alcohol to 10 percent concentration and 2 percent of solid potassium chloride is added. The solution is boiled, cooled, and left overnight. It is filtered through the same weighed filter paper through which the petroleum extracts have been filtered. The filter paper is washed with a little cold water and dried to constant weight. These so-called insoluble saponifiables consist probably of the potassium salts of substances derived from the waxes present in the mixture. They are partly or wholly soluble in 50 percent alcohol, insoluble in 10 percent alcohol containing ½ percent of potassium chloride, and insoluble, or but very slightly soluble, in light petroleum. The determination of these insoluble substances furnishes a simple and direct indication of the amount of waxes present. Vegetable oils and fats yield only minute quantities. Cocoa butter for example furnishes about 0.5 percent. Waxes on the other hand furnish large quantities. Examination of several specimens of beeswax and wool wax gave the following mean results for the insoluble saponifiables determined by the above method: yellow English beeswax 27 percent, wool wax 45 percent.

C-362—SAPONIN, REACTION FOR—SAGEL

(*Merck Index*)

On rubbing a little saponin with two drops acetic anhydride, then allowing a drop of concentrated H_2SO_4 to run in, a more or less intense red band immediately forms at the point of contact.

C-363—SESAME OIL

Baudouin Test-Official

(*A.O.A.C.*)

Dissolve 0.1 gm of finely powdered sugar in 10 ml of HCl, add 10 ml of the sample, shake thoroughly for one minute, and allow to stand for 10 minutes. In presence of even a very small admixture of sesame oil, the aqueous solution is colored crimson. It should be observed that some olive oils, especially those of African or Spanish origin, give pink or crimson colors. These can be readily differentiated from the color due to sesame oil by the modified Villavecchia test.

Modified Villavecchia Test-Official

Add 2 ml of furfural to 100 ml of alcohol. Mix thoroughly 0.1 ml of this solution with 10 ml of HCl and 10 ml of the sample by shaking them together in test tube for 15 seconds. Allow mixture to stand for 10 min., observe color, add 10 ml of H_2O, shake, and again observe color. If the crimson color disappears, sesame oil is not present. (As furfural gives a violet tint with HCl, it is necessary to use the very dilute solution specified.)

C-364—SOAPLESS SHAMPOOS, ASSAY OF

(*M. Lovat Hewitt, Perf. & Ess. Oil Rec.*, **27**, *431-3 1936*)

Essentially, the method consists of splitting up the compound with concentrated hydrochloric acid and determining the amount of free fatty alcohol liberated.

Weigh in a tared flask 5-7 gm of sample if the fatty alcohol content is believed to be about 30 percent, or 10-14 gm if it is thought to be considerably lower. Dissolve 50 cc of distilled water. Add 50 cc of pure concentrated hydrochloric acid and boil under a reflux condenser for one hour. On cooling it is possible that some fatty alcohol particles may be sticking to the inside of the condenser. Such particles should be dissolved back into the flask by spraying the inside of the condenser with ether.

The total contents of the flask are then extracted with ether, the lower watery layer run off and then re-extracted with ether. The united ether extracts are washed until neutral, with water, dried over anhydrous sodium sulfate (the sodium sulfate should be washed with fresh ether before use), and filtered. The ether is evaporated on a water bath and the last traces removed by a stream of hot air at a temperature of 50-60°C, blown into the flask for about 10 minutes. The quantity of material remaining in the flask gives the quantity of fatty alcohol in the original weight of sample.

C-365—SILICA

Using a platinum loop, make a bead of sodium metaphosphate by fusion. Bring the hot fused bead in contact with the questionable substance so that some is left on the bead. Fuse the bead again. If silica or a silicate is present, it does not dissolve in the bead but floats around on the surface of it.

C-366—SILICA PRESENT AS ALKALINE SILICATES, DETERMINATION OF

(*A.O.C.S.*)

When the material contains no mineral matter that is insoluble in water, ignite a sample of the soap containing not to exceed 0.2 gm of silica in a platinum dish at a a low temperature. When charred, extract the soluble salts with water, return the paper and charred residue to the dish and complete the ignition. Unite the residue in the dish and the water extract, carefully acidify with hydrochloric acid, finally adding the equivalent of from 5 to 10 cc strong hydrochloric acid in excess. The dish or casserole containing the solution should be covered with a watch glass while adding acid so as to avoid loss by spray.

When the material contains mineral matter insoluble in water, or a determination of highest accuracy is not necessary, take a portion of the solution after titrating the matter insoluble in alcohol (See "Total Matter Insoluble in Alcohol Determination") containing not more than 0.2 gm silica and add 5 to 10 cc strong hydrochloric acid.

Evaporate the acidified solution (washing off and removing the cover glass if used) to dryness on steam bath or hot plate at a temperature not exceeding 200°C. Cool, moisten with concentrated hydrochloric acid, let stand 5 to 10 minutes, breaking up all lumps with a stirring rod. Add about 25 cc of hot water. Heat a few minutes and filter through a small ashless paper. Wash thoroughly with hot water.

Evaporate the filtrate to dryness and repeat the above treatment, filtering on a second paper. Carefully ignite the two papers and contents in a weighed platinum crucible, first at a low temperature until the paper is consumed, but finally heating to constant weight over the blast lamp; cool in a desiccator before weighing. If extreme accuracy is desired, moisten the contents of the crucible with water, add 10 cc hydrofluoric acid and four drops of strong sulfuric acid, evaporate to dryness over a low flame, ignite at the temperature of the blast lamp for about two minutes, cool in a desiccator and weigh. The difference between this weight and the previous weight is the weight of the silica (SiO_2).

To calculate sodium silicate ($Na_2Si_4O_9$) multiply weight of SiO_2 by 1.26.

C-367—SILVER

(*U.S.P.*)

Solutions of silver salts yield with hydrochloric acid a white, curdy precipitate, which is insoluble in nitric acid but is easily soluble in ammonia T.S. To a solution of a silver salt add ammonia T.S. and a small quantity of solution of formaldehyde. Upon warming, a mirror of metallic silver is deposited upon the sides of the test tube.

C-368—RAPID SOAP ANALYSIS

(*T.M.B. Marshall, J. Soc. Dyers Colourists,* **52,** *299-302, 1936*)

The following method can be applied to the analysis of bar soap, soap flakes, etc., for routine analysis where a detailed examination is not necessary. The method is quite reliable and quicker than most of the methods in general use.

Weigh 0.5-1.0 gm of soap into a 250 cc conical flask and dissolve in 25 cc of a mixture of equal volumes of denatured alcohol and n-butyl alcohol, warming on the water bath if necessary. Add phenolphthalein and 0.1 *N* white spirit-potassium hydroxide or hydrochloric acid from a burette until neutral. (Ed. Note: White spirit is the petroleum solvent referred to frequently as turpentine substitute.) From this titration the amount of free fatty acids or free alkali present is calculated.

Add soap indicator, made by dissolving 0.16 gm of Eosine and 0.04 gm of Xylene Cyanol FF in 100 cc of equal volumes of denatured alcohol and n-butyl alcohol. The pH range of this indicator is 3.6-3.8. Titrate with 0.1 *N* white spirit hydrochloric acid until the indicator changes from fluorescent red to non-fluorescent bluish-green. The titration to the soap-indicator end point gives the combined alkali. If the nature of the fatty acid is known, the amount of soap present in the sample can be calculated from the combined alkali in the usual way. (Thru Soap.)

C-369—SIMPLE METHOD FOR PERCENTAGE OF ANHYDROUS SOAP IN LIQUID SOAPS

(*N. W. Matthews, Chemist Analyst,* **23,** *No. 3, 5, 1934*)

This is a quick and simple method of approximating the amount of anhydrous soap in liquid soap preparations. Extreme accuracy is not claimed for it; the results obtained are quite sufficiently accurate for ordinary routine work.

Pour 20 cc of the soap solution into a 25-cc glass-stoppered graduated cylinder. Now add 5 cc of concentrated sulfuric acid to the soap. Insert the glass stopper and shake the cylinder, taking great care to prevent the contents from being forced out by the great heat generated. Shake thoroughly, remove the stopper and allow the mixture to cool. A layer of oil will be seen floating on the liquid. Note the volume of this oil in cubic centimeters and by referring to the chart, the percentage of anhydrous soap in the original sample will be indicated directly. No calculations are necessary. The source of this method is unknown to the writer.

USING 20 CC OF LIQUID SOAP AND 5 CC OF ACID

Reading cc	% anhydr. soap	Reading cc	% anhydr. soap	Reading cc	% anhydr. soap
0.5	3.0	3.9	22.5	7.0	40.0
0.85	5.0	4.0	23.25	7.2	41.0
1.0	6.0	4.4	25.0	7.5	42.5
1.3	7.5	4.5	25.75	7.8	44.25
1.5	8.75	4.8	27.5	8.0	45.25
1.7	10.0	5.0	28.75	8.2	46.25
2.0	11.75	5.2	30.0	8.5	48.0
2.1	12.5	5.5	31.5	8.8	49.75
2.5	14.75	5.7	32.5	8.9	50.0
2.6	15.0	6.0	34.5	9.0	50.75
3.0	17.5	6.1	35.0	9.3	52.5
3.2	18.6	6.5	37.25	9.5	53.5
3.4	20.00	6.6	37.5	10.0	56.5
3.5	20.25				

C-370—SOAP-SYNTHETIC DETERGENT MIXTURES IN BAR FORM, ANALYSIS OF

(*Donald Berkowitz and Rubin Bernstein, Ind. & Eng. Chem., Anal. Ed.,* **16,** *239, 1944*)

Soap-synthetic mixtures of the type useful for saltwater cleaning consist of an active portion (soap and synthetic detergent) and an inactive portion (inorganic salts, moisture, and fatty matter). The term "fatty matter," refers to all constituents preferentially soluble in petroleum ether; such as hydrocarbons, fats, and free fatty acids. The term "active ingredient," is applied to the alcohol-soluble portion corrected for determined impurities. The present method is based on the separation of active ingredients from inorganic salts by means of ethyl alcohol, and the subsequent determination of soap fatty matter, and sodium chloride in the alcohol-soluble portion. Synthetic detergent is calculated as the difference between total alcohol-soluble matter and the sum of soap, fatty matter, and alcohol-soluble sodium chloride.

Procedure

Anhydrous, Salt-Free Soda Soap. Weigh to the nearest milligram a 2-gm sample of the soap-synthetic detergent bar in a tared 300-ml Erlenmeyer flask. Add 50 ml of

water and 50 ml of 95 percent ethyl alcohol. (Formula 2B or 30 alcohol may be used if 95 percent ethyl alcohol is not available.) Warm on the steam bath until no further solution takes place. Cool, add five drops of methyl orange indicator, and titrate with 0.5 *N* sulfuric acid to a pink color. Add 5 to 6 ml in excess. Transfer the contents of the flask to a 500-ml separatory funnel, washing out the flask with 50 ml of water, then with 50 ml of ethyl alcohol. Add the washings to the separatory funnel. Extract the fatty acids and fatty matter four times with petroleum ether, using 40-ml portions. Combine the petroleum ether extracts and wash with small portions of distilled water until the water washings are no longer acid to methyl orange.

Transfer the petroleum ether extracts to the original 300-ml tared flask, filtering if necessary, and wash the separatory funnel with two small portions of petroleum ether, adding the washings to the flask. Evaporate the petroleum ether on the steam bath, then dry in an oven at 100° to 105°C to constant weight. Cool and weigh as fatty acids plus fatty matter.

Dissolve the fatty acids and fatty matter in 50 ml of neutral ethyl alcohol with warming; add phenolphthalein indicator and titrate with standard alcoholic 0.1 *N* sodium hydroxide.

Calculate the percent of soap plus fatty matter as follows:

$$\text{Percent of soap} + \text{fatty matter} = \frac{(\text{ml of NaOH} \times \text{normality factor} \times 0.022) + (\text{weight of fatty acids} + \text{fatty matter})}{\text{weight of sample}} \times 100$$

Calculate percent of soap by subtracting from this value the percent of fatty matter determined later.

Alcohol-Insoluble Matter. Weigh to the nearest milligram a 2-gm sample in a 250-ml beaker, add 100 ml of 95 percent ethyl alcohol, cover the beaker, and heat on the steam bath with frequent stirring and maceration of the sample until it is completely distintegrated. Let settle and filter through a tared Gooch crucible with suction into a tared 300-ml Erlenmeyer flask, retaining as much of the residue as possible in the beaker. Repeat this extraction three times with 25-ml portions of hot 95 percent ethyl alcohol, each time retaining as much of the residue as possible in the beaker. Finally, evaporate any remaining alcohol and dissolve the residue in the smallest possible quantity of hot distilled water (5 ml should be sufficient). Reprecipitate the alcohol-insoluble matter by slowly adding with vigorous stirring 50 ml of 95 percent ethyl alcohol. Heat the solution to boiling on the steam bath, filter, and transfer the precipitate to the Gooch crucible, washing several times with 95 percent ethyl alcohol. Dry the crucible at 100° to 105°C to constant weight and calculate the percent of alcohol-insoluble matter. Reserve the combined filtrate and washings.

Alcohol-Soluble Matter. Evaporate the filtrate and washings obtained in the determination of alcohol-insoluble matter to dryness on the steam bath. Heat the residue to constant weight at 100° to 105°C and calculate the percent of alcohol-soluble matter.

Fatty Matter. Dissolve the alcohol-soluble matter in a mixture of 50 ml of water and 50 ml of 95 percent ethyl alcohol, warming if necessary. Transfer the solution to a 500-ml separatory funnel, washing out the flask with 50 ml of water, then with 50 ml of 95 per cent ethyl alcohol. Cool and extract fatty matter four times with petroleum ether, using 25-ml portions. Combine the petroleum ether extracts and wash four times with 10-ml portions of 0.2 *N* sodium hydroxide, adding the washings to the alcoholic solution which is reserved for the determination of chlorides. Finally, wash the petroleum ether extract with small portions of water until the water washings are no longer alkaline to phenolphthalein. Transfer the washed petroleum ether extract to a tared 300-ml Erlenmeyer flask, washing out the separatory funnel with two small portions of petroleum ether, and add the washings to the flask. Evaporate the petroleum ether on the steam bath and dry the residue at 100° to 105°C to constant weight. Calculate the percent of fatty matter.

Chlorides in Alcohol-Soluble Matter. Add 15 ml of 20 percent magnesium nitrate solution to the alcoholic solution remaining after the determination of fatty matter. Heat on the steam bath until the precipitate is coagulated, filter, and wash thoroughly with water. Make the filtrate acid with dilute nitric acid and determine chlorides by the Volhard method.

Synthetic Detergent, by Difference. Calculate the percent of anhydrous, salt-free, synthetic detergent as follows:

$$\%\ \text{synthetic detergent} = (\%\ \text{alcohol-soluble matter}) - (\%\ \text{soda soap} + \%\ \text{fatty matter} + \%\ \text{NaCl in alcohol-soluble matter})$$

C-371—SODIUM

(*U.S.P.*)

Sodium compounds after conversion to chloride or nitrate yield with cobalt-uranyl acetate T.S. a golden-yellow precipitate, which forms after several minutes' agitation. Sodium compounds impart an intense yellow color to a nonluminous flame.

C-372—SODIUM, REAGENT FOR—BALL

(*Merck Index*)

Dissolve 50 gm potassium nitrite free from sodium in 100 cc water, neutralize if necessary with HNO_3, add 10 gm powdered bismuth nitrate, shake well, filter, add about 25 cc 10 percent cesium nitrate solution and let stand for a few hours. Filter and add a little HNO_3 before use. Sodium solutions produce with the reagent a yellow crystalline precipitate of bismuth-cesium-sodium nitrite.

C-373—SODIUM, TEST FOR—CALEY

(*Merck Index*)

The reagent is made by mixing a 4 percent solution of uranyl acetate in 3 percent acetic acid with a 20 percent solution of cobalt acetate. On shaking 20 cc of the reagent with 1 cc of the solution to be tested, a yellow precipitate is formed if sodium is present.

C-374—SODIUM ACETATE

(*N.F.*)

An aqueous solution of sodium acetate responds to the tests for sodium and for acetate.

Upon ignition, sodium acetate yields an alkaline residue which effervesces with acids.

Assay: Weigh accurately about 0.25 gm of sodium

acetate, previously dried to constant weight at 120°C, into a platinum or porcelain crucible and proceed as directed under the assay for Solution of Potassium Citrate. Each cc of tenth-normal sulfuric acid is equivalent to 0.008204 gm of CH_3COONa.

C-375—SODIUM ALGINATE

(Bull. Natl. Form. Comm. ***13,*** *25, 1945)*

Sodium alginate is sparingly soluble in water. It is insoluble in alcohol and in hydro-alcoholic solutions in which the alcohol content is greater than 30 percent by weight. It is insoluble in chloroform and in ether. It is insoluble in acids when the pH becomes lower than four.

Identification: A: To 5 cc of an aqueous solution of sodium alginate (1 in 100) add 1 cc of calcium chloride T.S. A voluminous gelatinous precipitate is formed immediately.

B: To 10 cc of an aqueous solution of sodium alginate (1 in 100) add 1 cc of diluted sulfuric acid. A heavy gelatinous precipitate is produced.

Starch: To 5 cc of an aqueous solution of sodium alginate (1 in 1000) add one drop of iodine T.S.: the solution remains free from even a transient blue color.

Gelatin: To 5 cc of an aqueous solution of sodium alginate, add 1 cc of an aqueous solution of ammonium molybdate (1 in 20). No precipitate is produced in 5 minutes.

SODIUM ALKYL SULFATE

See Gardinol C-116 Dupanol C-143 and C-370.

C-376—SODIUM ALGINATE IN DAIRY PRODUCTS, DETECTION OF

(C. W. Schroeder and P. A. Racicot, Ind. Eng. Chem., Anal. Ed., ***13,*** *165-6, 1941)*

A positive test for dextrin indicates the presence of Na alginate. The food is treated with HCl and with alcohol to precipitate the gum. The gum is dissolved in 0.1 *N* NaOH and treated with 1 cc of concentrated H_2SO_4 saturated with Fe_2O_3. A purple color develops in the presence of Na alginate which turns to brown-black in more concentrated solutions. *(Thru C. A.* ***35,*** *2987, 1941.)*

C-377—SODIUM BORATE

(N.F.)

Assay: Dissolve about 2 gm of sodium borate, accurately weighed, in 50 cc of distilled water. Titrate with half-normal hydrochloric acid, using methyl red T.S. as the indicator. Each cc of half normal hydrochloric acid is equivalent to 0.05032 gm of $Na_2B_4O_7$.

C-378—SODIUM CARBONATE IN SODIUM BICARBONATE, DETECTION OF

(L. Rosenthaler, Pharm. Acta. Helv., ***13,*** *362, 1938)*

The presence of 0.5 percent of sodium carbonate in sodium bicarbonate can be detected as follows: to 1 gm of sodium bicarbonate in a test tube add 5 cc of water and cautiously stir a few times with a glass rod; decant the liquid into another test tube; treat the residue with 5 cc of water, stir and decant the liquid; to each solution, add five drops of 1 percent alcoholic phenolphthalein solution, mix well and note the red colors; if sodium carbonate is present, the first liquid shows red more strongly than the second. *(Thru J. Amer. Pharm. Assoc.* ***30,*** *188, 1941.)*

C-379—SODIUM BISULFITE

The product of commerce is a mixture of sulfite and meta bisulfite.

Total SO_2

Accurately weigh 250 mg into a flask containing 50 cc of 0.1 *N* iodine solution and 500 cc of water. Dissolve and titrate back with 0.1 *N* sodium thiosulfate. Subtract the amount of thiosulfate used from the amount of iodine solution used, to get the cc's of 0.1 *N* iodine used in the reaction. 1 cc of 0.1 *N* iodine = 0.003203 gm SO_2.

SO_2 as Metabisulfite

Place 50 cc of water into each of two flasks and add several drops of bromophenol blue indicator. Accurately weigh about 1 gm of the sample and place in the flask. Dissolve and titrate with 0.1 *N* sodium hydroxide until the color in the titrated bottle is the same as that of a blank containing 50 cc of distilled water and indicator. 1 cc 0.1 *N* sodium hydroxide = 0.009506 gm sodium metabisulfite anhydrous.

C-380—SODIUM HEXAMETAPHOSPHATE IN CALGON TREATED WATERS

(Calgon, Inc.)

As a means of controlling the feed of metaphosphate in the threshold treatment a direct method of determining metaphosphate in very low concentrations would be desirable, but no method suitable for routine field use has been devised. An indirect method has, however, been developed based upon the fact that Calgon does not respond to the ordinary colorimetric method used for the determination of orthophosphate and from that metaphosphate or Calgon may be converted quite rapidly into orthophosphate by the process of molecular rehydration when boiled in an acid solution.

This test is an adaptation of the Truog and Meyer modification of the Denigés colorimetric procedure. The metaphosphate is determined as the difference between the orthophosphate found in the water as it is sampled, and the orthophosphate found in the water after reversion of the metaphosphate to orthophosphate. The comparison of the color may be carried out either in Nessler tubes or a colorimeter. The color found is only stable for one-half hour and a fresh standard must be prepared each time the test is run.

Reagents

(1) 10 *N* Sulfuric Acid
(2) Standard Orthophosphate Solution
(3) 2.5 percent Ammonium Molybdate
(4) 2.5 percent Stannous Chloride in 10 percent solution of HCl

Preparation of Reagents

(1) To prepare approximately 10 *N* H_2SO_4, add 300 ml of concentrated H_2SO_4 (Specific Gravity—1.84) to 600 ml of distilled water. The acid should be added cautiously and, if possible, the beaker should be immersed in cold water. After the acid has been added, cool the solution and make up to one liter (1000 ml).

(2) Dissolve exactly 0.1335 grams of KH_2PO_4, reagent grade, in water and make up to one liter.

(3) Dissolve 25 grams of ammonium molybdate, reagent grade, in water and make up to one liter. Filter the solution if slight turbidity persists.

(4) Add exactly 10 ml of concentrated HCl to 90 ml of distilled water. Dissolve 2.5 grams of $SnCl_2.2H_2O$, reagent grade, in this solution and filter after solution is complete if turbidity exists. This solution should be kept in a bottle with a stop-cock at the bottom and a layer of pure mineral oil 5 mm thick floated over the surface.

Apparatus Required

3—250 ml Erlenmeyer flasks
1—100 ml graduated cylinder
1—4 ml pipette
1—2 ml pipette
1—Hot plate or other means of boiling a solution
1—Set of Nessler tubes or a colorimeter
1—1 ml pipette

Procedure for Testing

1. Filter about 250 ml of water to be tested through a Whatman #42 filter paper (or equal) to remove suspended matter. Measure out two 100 ml samples in the graduated cylinder and put these in separate Erlenmeyer flasks.

2. Pipette 4 ml of 10 *N* H_2SO_4 into one of the flasks containing the water to be tested and boil for four hours. Replenish the water which boils off with phosphate-free water keeping the volume between 50 and 100 ml at all times. At the end of the boiling period transfer the contents of the flask to the graduated cylinder and make up to 100 ml with phosphate-free water. Add further 4 ml of water from the pipette. Return this 104 ml of solution to the flask and cool.

3. Pipette 4 ml 10 *N* H_2SO_4 into the other flask containing water to be tested and 4 ml into the flask containing the phosphate free water. Mix all flasks well.

4. Prepare standards by adding 1 ml of standard orthophosphate solution for each ppm. phosphate desired and dilution to 100 ml with phosphate-free water.

5. Add 4 ml of molybdate solution to each of the three flasks and mix thoroughly.

6. Add eight (8) drops of stannous chloride solution to each flask and compare depth of color after five minutes. Mix well immediately after $SnCl_2$ solution is added.

Discussion

If Nessler tubes are used in the determination, a series may be prepared by adding varying amounts of standard orthophosphate solution to 100 ml portions of phosphate-free water and developing the blue color with addition of 4 ml of 10 *N* H_2SO_4, ml of 2.5 percent ammonium molybdate, and eight (8) drops of 2.5 percent stannous chloride solution.

If colorimeter is to be used the three solutions described can be compared without the necessity of preparing a range of standards.

The standard orthophosphate solution is of such a concentration as to give an amount of phosphorous equivalent to one part per million of sodium hexametaphosphate when 1 ml is diluted to 100 ml.

An autoclave may be used in place of the boiling for reverting the metaphosphate to orthophosphate. Reversion will be complete in 20 minutes at 20 lb. pressure. Samples should then be cooled and determination carried on in usual manner.

Calculations

Parts per million of phosphate found in boiled (reverted) sample minus parts per million of phosphate found in unboiled sample, is the amount of metaphosphate in the sample at the time of testing.

C-381—SODIUM HYDROXIDE

(U.S.P.)

On gm of sodium hydroxide dissolves in 1 cc of water at 25° C. It is freely soluble in alcohol.

Identification: An aqueous solution of sodium hydroxide (1 in 25) responds to the tests for sodium.

Potassium: An aqueous solution of sodium hydroxide (1 in 20), acidified with acetic acid, yields no precipitate on the addition of a few drops of sodium cobaltinitrite T.S.

Assay: Dissolve about 1.5 gm of sodium hydroxide, accurately weighed, in about 40 cc of recently boiled and cooled distilled water. Cool the solution to 15° C, and titrate with normal sulfuric acid, using phenolphthalein T.S. as the indicator. At the discharge of the pink color of the indicator, record the volumes of acid solution required, add 3 drops of methyl orange T.S., and continue the titration to the production of a persistent pink color. Each cc of normal sulfuric acid consumed is equivalent to 0.04001 gm of NaOH. Each cc difference between the number of cc of normal sulfuric acid consumed in the methyl orange and phenolphthalein titrations is equivalent to 0.1060 gm of Na_2CO_3.

C-382—SODIUM PERBORATE

(U.S.P.)

A saturated aqueous solution of sodium perborate is alkaline to phenolphthalein T.S., and when acidified with hydrochloric acid, responds to the identification tests for sodium and for borate.

Agitate a mixture of 1 cc of an aqueous solution of sodium perborate (1 in 50), 1 cc of diluted sulfuric acid, a few drops of potassium dichromate T.S., and 2 cc of ether; the ether acquires a blue color.

Assay: Dissolve 1 gm of sodium perborate in 10 cc of distilled water and 10 cc of diluted sulfuric acid, and titrate the solution with tenth-normal potassium permanganate. Each cc of tenth normal potassium permanganate is equivalent to 0.0008 gm of available oxygen.

C-383—SODIUM PROPIONATE

(Bull. Natl. Form. Comm. **13**, *26, 1945)*

Sodium propionate occurs as colorless, transparent crystals or a granular, crystalline powder. It is odorless, or has a faint acetic-butyric odor. It is deliquescent in moist air.

Identification: A: An aqueous solution of sodium propionate (1 in 20) responds to the tests for sodium, C371.

B: Upon ignition, sodium propionate yields an alkaline residue which effervesces with acids.

C: When sodium propionate is warmed with sulfuric acid, propionic acid, recognized by its odor, is evolved.

Assay: Weigh accurately about 0.25 gm of sodium propionate, previously dried to constant weight at 105° into a platinum or porcelain crucible and proceed as directed under the assay of alkali salts of organic acids, C-25. Each cc of 0.5 *N* sulfuric acid is equivalent to 0.04803 gm of CH_3CH_2COONa.

C-384—SODIUM STEARATE

(U.S.P.)

When heated, sodium stearate fuses. At a higher temperature it decomposes, giving off inflammable vapors and the odor of burning fat, finally leaving a residue which, when moistened with distilled water, is alkaline to litmus paper, effervesces with acids, and colors a non-luminous flame intensely yellow.

Dissolve 50 gm of sodium stearate in 500 cc of hot distilled water, add 50 cc of dilute sulfuric acid (made by adding 1 volume of sulfuric acid to 3 volumes of distilled water), and heat the solution with frequent stirring until the fatty acids separate cleanly as a transparent layer. Wash the acids with boiling distilled water until free from sulfuric acid, collect them in a small beaker, and place on a water bath or steam bath until the water has settled and the fatty acids are clear. Allow the acids to cool, melt, and filter them into a dry beaker while hot, and dry for 20 minutes at 100° C: the solidification temperature of the fatty acids is not less than 54° C.

C-385—SODIUM SULFITE

(U.S.P.)

Identification: An aqueous solution of exsiccated sodium sulfite (1 in 20) responds to the tests for sodium and for sulfite.

Assay: Accurately weigh about 0.25 gm of exsiccated sodium sulfite, and add it to 50 cc of tenth-normal iodine. After standing five minutes add 1 cc of hydrochloric acid, and titrate the excess of iodine with tenth-normal sodium thiosulfate, using starch T.S. as the indicator. Each cc of tenth-normal iodine is equivalent to 0.006303 gm of Na_2SO_3.

C-386—SODIUM AND POTASSIUM, SEPARATION OF

(L. Szebelledy and Karl Schick. Z. anal. Chem., 97, 106-16, 1934, cf. C. A. 27, 1590)

Ten cc of a mixture of equal parts isobutyl alcohol and absolute ether dissolve only 2 mg of dry KI, but the same volume of the mixture dissolves at least 500 mg of NaI. By treating the dry iodides with this solvent, therefore, a fair separation of Na and K can be made. Chlorides and carbonates are easily converted to iodides. Nitrates can be converted into chlorides and then changed to iodides. Sulfates react with HI to form So_2 and I_2 so that only phosphate need be removed before attempting the separation of Na from K. If an allowance of 0.6 mg is made for the solubility of KI, the results obtained for both Na and K are satisfactory.

C-387—COMBINED SODIUM AND POTASSIUM OXIDES IN SOAPS, DETERMINATION OF

(A.O.C.S.)

Since no available standard methods are known for determining the sodium ion, it was decided to determine this by difference, the total combined alkali present in the soap being determined by the standard A.O.C.S. procedure of titrating the fatty acids from a weighed sample of soap.

COMBINED POTASSIUM OXIDE-LINDO-GLADDING METHOD (MODIFIED)

1. *Reagents*

(a) Ammonium Chloride Solution.

Dissolve 100 grams of NH_4Cl in 500 ml of distilled water, add 5-10 grams of pulverized K_2PtCl_6 and shake at intervals for 6 to 8 hours. Allow the mixture to settle overnight and filter. (The residue may be used for the preparation of a fresh supply.

(b) Platinum Solution.

A Pt solution containing the equivalent of 1 gram of metallic Pt (2.1 grams of K_2PtCl_6) in every 10 ml. For materials containing less than 15 percent of K_2O, a Pt solution containing 0.2 gram of metallic Pt (0.42 gram of K_2PtCl_6) in each 10 ml is recommended.

II. *Preparation of Sample*

Weigh 10 grams (±0.01 gram) sample of soap. The soap shall be sintered below a dull red heat, the ash leached with hot water, filtered into a 100 ml volumetric flask and the paper washed with three, 5 to 10 ml portions of hot water. The ashing shall be completed by returning the filter paper to the original dish. Excessive heating shall be avoided. Removal of most of the alkali present before completion of the ashing aids in preventing the over-heating of the greater portion of the sample. Add a few drops of 1:1 HCl to the dish and wash contents into the volumetric flask. Acidify the contents of the volumetric flask with the contents of the volumetric HCl, dilute to 100 ml, mix and pass through a dry filter and then proceed as directed under determination.

III. *Determination*

Acidify a 10 ml aliquot of the solution prepared under (II) with a few drops of HCl, add 10 ml of the platinum solution (prepared under I-b) and evaporate on a water bath to a thick paste which becomes solid upon cooling to room temperature, avoiding exposure to NH_3. Treat the residue with approximately 6 ml of 80 percent alcohol, adding 0.6 ml of HCl. Filter on a Gooch crucible and wash the precipitate thoroughly with 80 percent alcohol, both by decantation and on the filter, continuing the washing after the filtrate is colorless. Then wash 5 or 6 times with 25 ml portions of the NH_4Cl solution (prepared under I-a) to remove impurities from the precipitate. Wash again thoroughly with 80 percent alcohol and dry the precipitate for 30 minutes at 100° C. Weigh and calculate to K_2O. (The precipitate should be completely soluble in water).

For the conversion of K_2PtCl_6 to K_2O use the factor 0.19376.

C-388—SOLIDIFICATION TEMPERATURE OF FATTY ACIDS

(U.S.P.)

Preparation of the Fatty Acids: Heat 75 cc of glycerin-potassium hydroxide solution (made by dissolving 25 gm of potassium hydroxide in 100 cc of glycerin) to 150° C in an 800-cc beaker, and add 50 cc of the clarified fat, melted if necessary. Heat the mixture for 15 minutes with frequent stirring, but do not allow the temperature to rise above 150° C. When saponification is complete, the mixture is homogeneous, with no particles clinging to the beaker at the meniscus. Pour the soap into 500 cc of nearly boiling distilled water in an 800-cc beaker or casserole, add slowly 50 cc of dilute sulfuric acid (made by adding 1 volume of sulfuric acid to 3 volumes of distilled water), and heat the solution with frequent stirring, until the fatty acids separate cleanly as a transparent layer.

Wash the acids with boiling water until free from sulfuric acid, collect them in a small beaker, and place on a boiling water bath or steam bath until the water has settled and the fatty acids are clear. Allow the acids to cool, melt, and filter into a dry beaker while hot, and dry for 20 minutes at 100° C.

Test for Complete Saponification: Place 3 cc of the dry acids in a test tube and add 15 cc of alcohol. Heat the solution to boiling and add an equal volume of ammonia water. A clear solution should result.

Determination of the Solidification Temperature: Cool the dry filtered acids to from 15 to 20 degrees above the expected reading, and transfer to a glass tube 25 mm in diameter and 100 mm in length, the glass being 1 mm in thickness. By means of a perforated cork fasten the tube in a wide-mouth bottle of clear glass, approximately 70 mm in diameter and 150 mm in height. Suspend a thermometer in the melted acids so that it will serve as a stirrer, cooling if necessary, and stir the mass slowly until the mercury remains stationary for 30 seconds. Then allow the thermometer to hang quietly, with the bulb in the center of the acids, and observe the rise of the mercury column. The highest point to which it rises is the solidification temperature of the fatty acids.

C-389—SOLUBILIZED OILS AND FATS

(A.A.T.C.C.)

This includes sulfated and saponified fats, sulfated fatty alcohols, fatty amides (cationic softeners) and fatty quaternary ammonium compounds. These substances will be contained in the alcohol extract, (c). A qualitative test for the presence of fatty cationic compounds should first be made by dissolving the extract, (c), in approximately 25 ml of distilled water and then immersing two clean copper strips which are connected by wire to the two poles of a 45 volt "B" battery. If fatty matter is deposited on the surface of the negative strip a cationic softener is present. If no fatty deposit is noticed on the negative strip proceed to separate anionic fatty matter as follows:

Add 2 drops of methyl orange solution (0.1 percent) to the solution used in the above test. Transfer to a 125 ml separatory funnel, add 30 ml of ethyl ether, 6 grams of sodium chloride and 0.1*N* hydrochloric acid drop by drop, shaking vigorously after each addition, until the brine layer is distinctly acid. Allow to separate into two perfectly clear layers and carefully draw off and discard the lower one. Wash the ether layer with 15 ml of portions of neutral sodium chloride solution (25 percent) until the extract is neutral to methyl orange. After the final wash add 10 grams of anhydrous sodium sulfate and shake vigorously for 5 minutes. Filter through a fritted glass filter into a tared 50 ml beaker containing 1.0 ml of 0.5 *N* potassium hydroxide. Evaporate the ether in a water bath and dry to constant weight at 100°±2° C. To obtain the actual weight of fatty matter subtract the added weight of the KOH (normality x 0.0281).

Test the residue for the presence of sulfate by acidifying an aqueous solution of the ash with hydrochloric acid and adding a drop or two of barium chloride solution. A white precipitation indicates the presence of sulfated fat or fatty alcohol in the finish. If sulfate test is negative, fatty matter must have been present in the form of soap.

Calculate percent "Sulfated Fatty Matter" or "Soap," as the case may be, based on the weight of original bone-dry fabric.

C-390—SOYBEAN OIL, TEST FOR—RICHARD

(Merck Index)

Gently shake 10 cc of the oil in a test tube with 1 cc of HNO_3 until an emulsion-like liquid results, then keep the test tube for 15 minutes in boiling water, then allow to cool. Soy bean oil, in contrast with olive or peanut oil similarly treated, remains fluid, and acquires a brown-red color, whereas the other oils only become yellow.

C-391—SPERMACETI

(U.S.P.)

The specific gravity of spremaceti is about 0.94° at 25° C. Spermaceti melts between 4°2 and 50° C.

Paraffin and Free Acids: Spermaceti dissolves completely in 50 parts of boiling alcohol and the solution is neutral or not more than slightly acid to moistened litmus paper.

Stearic Acid: Warm a mixture of about 1 gm of spermaceti and 10 cc of ammonia thoroughly for a few minutes, cool, filter, and acidulate the filtrate with hydrochloric acid: the liquid may become turbid, but yields no precipitate.

(Chapter IV continues in subsequent issue.)

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